

THE CITY WITH NO STREET:
Information Communication Technology, Urban Public Space, and
Architecture

By

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B.Arch.Sci, Ryerson University, 2011

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Abstract

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Our experience of the city, private or public, is no longer primarily influenced by physical built form but by various media, digital information, and communication technologies we interact with and through on a daily basis. The shift in influence not only blurs what used to be public and private space, but also modifies our behavior through space and time.

Along with some of these technological transformations come new social situations, and with them new spatial practices will emerge. Precisely for this reason, I want to find out the trajectory of the current social situation influenced by information communication technology, and how it will alter future spatial organization both at the urban scale and the human scale. The aim of the thesis is to ask questions and also to provoke discussion of the relationship between the cybernetic public space and the physical public space.

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I am heartily thankful to my supervisor, Marco Polo, whose encouragement, guidance and support from the initial to the final stage enabled me to develop an understanding of the thesis topic.

Lastly, I offer my regards and blessings to all of those who have supported me in all respects during the completion of the project.

Dedication

I would like to dedicate this thesis to my family for their love and support.
I would also like to thank my father, who has always encouraged me in achieving my dream.

Table of Contents

Author's Declaration	iii
Abstract	iv
Acknowledgements	v
Dedication	vi
Table of Contents	vii
List of Figures	ix
List of Appendices	xx

PART ONE

CHAPTER 1: The Online Revolution	1
Introduction	4
The New Roles of the Urban Private and Public Spheres	9
The Intent of the Thesis	12
The Research Questions	14
Urbanization and the Post-Information Age 3.0	17
Chapter 2: The Foundation of Social Theory	22
Evolution of the Urban Social Transformation	23
From Mechanical to Organic Solidarity	24
The Tools that Shape Us	30
Digitization of the Public Sphere	34
The Public Sphere in the New Media Era	40
Chapter 3: The Critique of Social Theory	45
Contemporary Theories behind the Decline of the Public Sphere	45
The Critique of Virtual Space	52
Design Intervention One: The City with No street	56

PART TWO

CHAPTER 4: Architecture for the “New Digital Public”	87
Scope of Part Two	87
Architecture as Interactive Communication Vessel	89
Design Exercise One - The Perception of Time and Space	90
Design Exercise Two - The Network City	92
Design Exercise Three - The Interface City	94
Design Intervention Two: The New Tahrir Square	99
The Capacity of the Physical and Digital Public Space	102
Design Concept	103
Adaptive Canopy	112
A Walkthrough of the New Tahrir Square	122
Conclusion	126
APPENDICES	129
BIBLIOGRAPHY	146

List of Figures

PAGE	FIGURE	DESCRIPTION
2	Fig. 1.01	A Scene at the protest in Egypt, 2011 http://dailymail.co.uk
4	Fig. 1.02	A Egyptian crowd using mobile phones http://newsimg.bbc.co.uk
5	Fig. 1.03	Internet blackout in January 2011 Arbor Networks, diagram edited by author
7-8	Fig. 1.04	Mobile phone and internet usage in Egypt and Canada Diagram by author
8-9	Fig. 1.05	“Really”, TV advertisement Windows Phone 7, images edited by author
10	Fig. 1.06	A scene in the movie <i>Playtime</i> http://2.bp.blogspot.com/-ebmenNG1Enc/Thsho51d3UI/AAAAAAAAEFY/QpKU1c3I48k/s400/play_time_apartments.jpg
11	Fig. 1.07	A scene in the subway where commuters create their own “private bubbles” Yourdon Edward
12-13	Fig. 1.08	Parti Diagram Diagram by author
14	Fig. 1.09	Types of public space Images edited by author
16	Fig. 1.10	Urbanization http://fr.fotopedia.com/items/flickr-3241917562/slideshow

PAGE	FIGURE	DESCRIPTION
20	Fig. 1.11	Post-information Age 3.0 Diagram by author
21	Fig. 1.12	Crowd sourcing AmsterdamREALTIME
22	Fig. 2.01	Foam City Peter Sloterdijk, image edited by author
24-25	Fig. 2.02	Social evolution Diagram by author
27	Fig. 2.03	Foam City Peter Sloterdijk
29	Fig. 2.04	Social situation created by modernity and urbanization http://www.flickr.com/photos/31047445@N04/4545154189/
30	Fig. 2.05	The tools that shape us Image by author
34	Fig. 2.06	Digitization of the Declaration of the Rights of Man and of the Citizen Image by author
36	Fig. 2.07	Digitization of the public sphere Image by author
38-39	Fig. 2.08	An abstract vision of the digital public space Image by author
40	Fig. 2.09	Model of the public sphere from mid to late 20th century International Journal of Strategic Communication, diagram edited by author

PAGE	FIGURE	DESCRIPTION
42	Fig. 2.10	Model of the public sphere in the 21st century International Journal of Strategic Communication, diagram edited by author
43	Fig. 2.11	Web Trend Map 4 iA (Information Architects)
44	Fig. 3.01	Web Trend Map 4 iA (Information Architects)
46	Fig. 3.02	Jurgen Habermas' ideal public sphere International Journal of Strategic Communication, diagram edited by author
47	Fig. 3.03	Jurgen Habermas' ideal public sphere International Journal of Strategic Communication, diagram edited by author
47	Fig. 3.04	Counter public sphere and public labyrinth Diagram by author
49	Fig. 3.05	Jurgen Habermas, Hannah Arendt, Richard Sennett Image edited by author
51	Fig. 3.06	Lever House: transparent but isolated http://www.american-architecture.info/USA/UES012-Lever.jpg
52	Fig. 3.07	Virtual and physical reality Image by author
55	Fig. 3.08	Simulation world Image by author
56	Fig. 3.09	Axonometric diagram of the City with No Street Diagram by author

PAGE	FIGURE	DESCRIPTION
57	Fig. 3.10	Diagram of Roman Grid Plan, Haussmann's Plan for Paris, and layout of the City with No Street Diagram by author
58	Fig. 3.11	Sectional Diagram Diagram by author
59	Fig. 3.12	Communication technologies diagram Diagram by author
60-87	Fig. 3.13	Perspectives Renderings of the City with No Street Images by author
86	Fig. 4.01	One-way to multi-way communication model Images edited by author
90-91	Fig. 4.02	Perception of time and space diagram Diagram by author
92	Fig. 4.03	Physical model of the Network City Model by author
93	Fig. 4.04	Rendering of the Data Centre Image by author
93	Fig. 4.05	Axonometric diagram of teh Network City Diagram by author
94	Fig. 4.06	Rendering of the Interface City Image by author
95	Fig. 4.07	Axonometric diagram of the Interface City Diagram by author
96-97	Fig. 4.08	A scene at Tahrir Square, Cairo http://i.dailymail.co.uk/i/pix/2011/01/30/article-1351904-0CF99CD3000005DC-746_634x423.jpg

PAGE	FIGURE	DESCRIPTION
98	Fig. 4.09	Site Aerial Photo DigitalGlobe
99	Fig. 4.10	Map of Cairo Diagram by author
99	Fig. 4.11	Egyptian Revolution in 2011 http://19.org/wp-content/uploads/2011/02/tahrir_square.jpg
100	Fig. 4.12	Tahrir Square site plan and scale comparison Diagram by author
102	Fig. 4.13	Physical versus digital public space Diagram by author
103	Fig. 4.14	The “island” diagram Diagram by author
103	Fig. 4.15	Parti diagram - the “common ground” Diagram by author
104	Fig. 4.16	Site plan Drawing by author
105	Fig. 4.17	Axonometric diagram Diagram by author
106-107	Fig. 4.18	Aerial perspective Image by author
108	Fig. 4.19	Plan of the Open Public Space Image by author
109	Fig. 4.20	Ventilation/parking access towers Image by author

PAGE	FIGURE	DESCRIPTION
109	Fig. 4.21	Dune-like urban seatings Image by author
110-111	Fig. 4.22	Ground perspective Image by author
112	Fig. 4.23	Canopy configuration plans Diagram by author
113	Fig. 4.24	The design concept and the new public mass Images edited by author
114	Fig. 4.25	Adaptive canopy concept diagram Diagram by author
116	Fig. 4.26	Sectional diagram Diagram by author
117	Fig. 4.27	Physical model of the tensile structure Model by author
118	Fig. 4.28	3 configurations of the adaptive canopy Diagram by author
119	Fig. 4.29	Prayers underneath the canopy Image by author
120	Fig. 4.30	Form generation investigation in Rhino Image by author
120-121	Fig. 4.31	Process of form generation of the adaptive canopy Diagram by author
122-123	Fig. 4.32	Perspective rendering of the New Tahrir Square Image by author

PAGE	FIGURE	DESCRIPTION
124-125	Fig. 4.33	Aerial Perspective of the New Tahrir Square Image by author
132	Fig. a.01	The Phalanstère http://1.bp.blogspot.com/_0gElmue-GM8/TDxfn-hHbcl/AAAAAAAAAKE/nUHEG5ig2xQ/s1600/Fourier,+mod%C3%A8le+de+phalanst%C3%A8re.jpg
132	Fig. a.02	Ville Contemporaine http://listverse.files.wordpress.com/2008/09/picture-5-7.png
136	Fig. a.03	New Babylon http://benandjess.files.wordpress.com/2008/12/nb0.jpg
136	Fig. a.04	Fun Palace http://allfordeadtime.files.wordpress.com/2010/06/fun_palace.jpg
140	Fig. a.05	Plug-in City http://www.treehugger.com/plugincity.jpg
141	Fig. a.06	Suitaloon http://archimorph.files.wordpress.com/2011/09/2824_medium.jpg?w=420&h=258
142	Fig. a.07	Continuous Monument http://www.megastructure-reloaded.org/typo3temp/pics/408e69ddbf.jpg
143	Fig. a.08	No-Stop City http://parole.aporee.org/files/ga12/Archizoom_No_Stop_city.jpg

PAGE	FIGURE	DESCRIPTION
144	Fig. a.09	Open Columns http://cva.ap.buffalo.edu/opencolumns/
145	Fig. a.10	Hylozoic Soil http://farm3.static.flickr.com/2427/3813082825_215ac3ba54_o.jpg

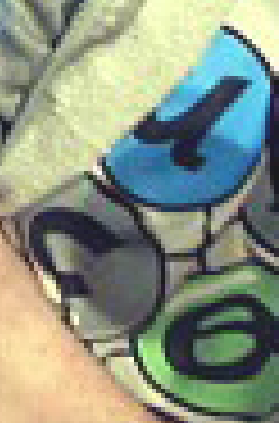
List of Appendices

PAGE	DESCRIPTION
129	Visionary Architecture and the Century of the Self
133	1. The Rational Cities: Phalanstère & Ville Contemporaine
137	2. Social Experimentation: New Babylon & Fun Palace
140	3. Digital Transmutation: Plug-in City & Suitaloon
142	4. Critical Architecture: Continuous Monument & No-Stop City
144	5. Responsive Architecture: Open Columns & Hylozoic Soil

PART ONE



ولا يبيع
التي كانت في
والبيعه ثمانين
سنة



“... this revolution started online.” (Ghonim, 2011)

Wael Ghonim, a marketing manager for Google, was one of the key players in initiating the Egyptian protest of January 25th, 2011. He gathered hundreds of thousands of young supporters on Facebook and was arrested shortly after the first protest broke out in Cairo. Since his release, Ghonim has become a symbol for the Egyptian movement.

Figure 1.01

A scene at the protest in Egypt, 2011, where live feeds through mobile phones are crucial to support advocacy



Figure 1.02

Information communication technologies (such as handheld mobile devices) not only connect individuals through the vast network, but also become the eyes of the evolving public realm.

Chapter 1 The Online Revolution

Introduction

On January 27th, 2011, while I was conducting research for my architectural thesis on how information communication technologies transform urban public space and influence the course of architecture, a social revolution occurred in Egypt. The immediate response from the Egyptian government was to create an unprecedented major communication blackout to block the digital and telecommunication channels between the protestors, the Egyptian citizens, and the outside world. Different means of communication portals were shut down including the internet and mobile phone service, stopping protestors from posting any live updates via Twitter, Facebook, YouTube, and SMS messenger. Under pressure from the then-president of Egypt, Hosni Mubarak, nearly all of the major ISPs (Internet Service Providers), without warning, took their services offline within minutes (fig 1.03.). At one point, mobile phone services were also shut down, making land line phones and satellite phones the only electronic devices on which one could share information (Zakaria, 2011).

The blackout was enacted in order to cripple the growing nation-wide protests. However, little did the Egyptian government know, the communication blockade soon became fuel for a bigger and more violent wave of street protests. "Up until now, Egyptians have had open access

to the web,” said Robert Faris, who is a research director in the Berkman Centre for Internet and Society at Harvard University, “they have gone from open internet to no internet, and that has got to be a big shock...” (MailOnline, 2011) Many young Egyptians have grown accustomed to using the internet to discuss local concerns, economic conditions and political debates. To them, taking out the online communication was equivalent to eliminating their daily public interaction and freedom of speech (Ghonim, 2011).

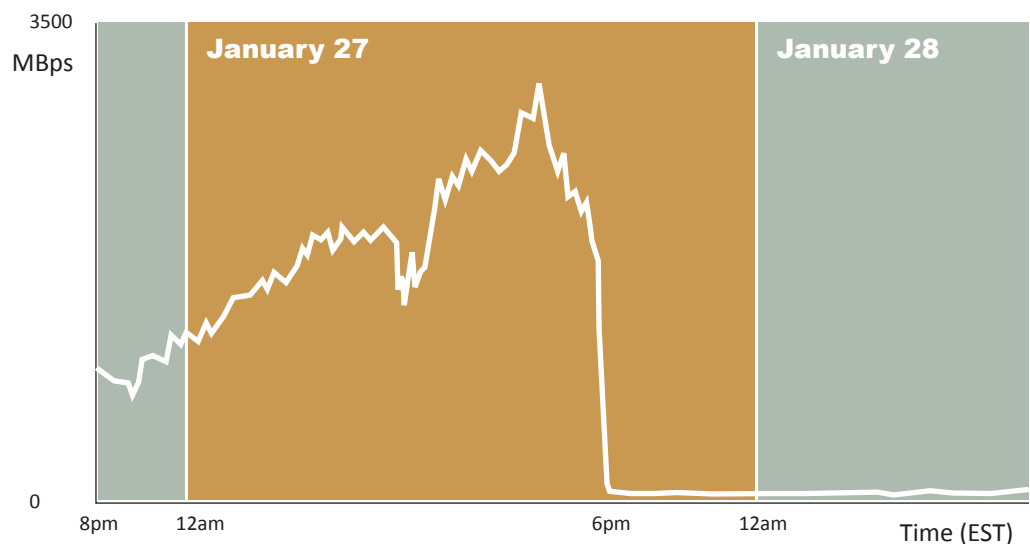
During the seven-day long communication blackout, streets were filled with hundreds of thousands of angry demonstrators. Without any communication tools, messages were conveyed through word of mouth – with that many people on the street, it was confusing, frustrating, and very dangerous. Without the internet, many of them had no choice but to leave their homes and take to the streets in a more aggressive manner.

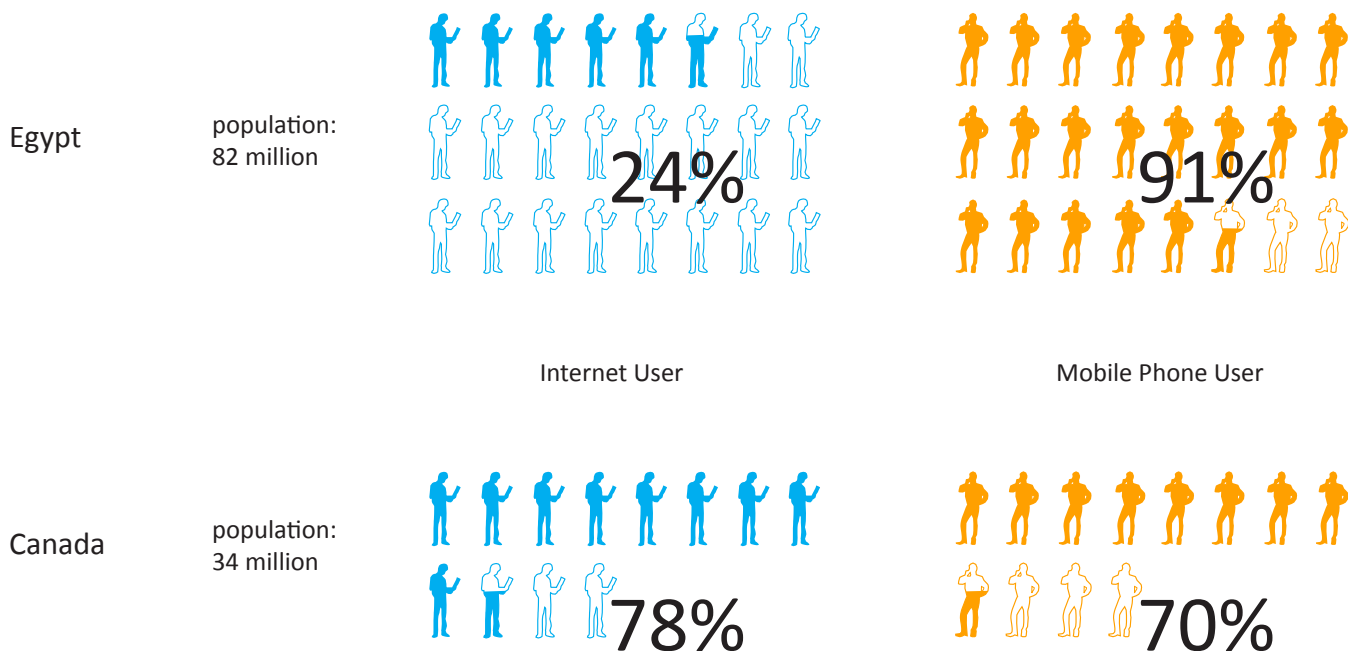
Toward the end of the revolt on February 11th 6pm local time, Mubarak stepped down as the Egyptian president; however, more than eight hundred people had died, with thousands wounded (Haaretz, 2011).

Some people might argue that the triumph of this revolution was the result of the good old fashioned street protest which occurred after the communication blackout. However, Wael Ghonim, a symbolic figure for the protest, believes that the revolt would not have been as successful

Figure 1.03

Internet traffic to and from Egypt on January 27-28. (Source: Arbor Networks). At approximately 5:20 pm EST, internet traffic into and from Egypt across 80 service providers around the world dropped dramatically. (diagram edited by author)





if not for the one full year of reaching out to young Egyptians through the help of information communication technologies prior to the actual street protest (Ghonim, 2011). The case of the Egyptian revolution in 2011 proves that the online community established by digital social media is not merely a virtual “un-real” temporary space for fleeting forms of social engagement. In Egypt’s case, the mobile and internet networks surely mark a remarkable achievement by hosting intense yet peaceful online rallies, real-time peer-to-peer debates, and virtual protests (blogspace) which spread nation-wide in a very short period of time (ElBaradei, 2011) – to the point that the government felt threatened and insecure and chose to cut off the network.

Without a doubt, it was the wireless, the mobile, and the digital realm – the system of information communication technology – which enabled the rapid development of the social movement in Egypt. Information communication technology, or ICT (an extended synonym for IT), refers to any type of electronic communication which consist of all technical means used to process information and to enhance communication, including



Growth of Internet User (2000 - 2011)

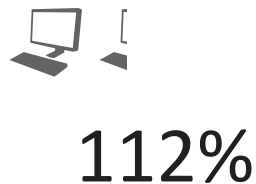


Figure 1.04

Although the proportion of the population using internet is lower than Canada, the growth in Egypt in the last 10 years was a staggering 4000%. The Egyptian public now rely heavily on the information communication technologies to conduct daily business and share public opinions, especially through mobile phones. (diagram by author)

computer and network hardware, communication middleware, as well as the corresponding software. In a more specific description, ICT comprises, but is not limited to: integrated telecommunications (land line telephone and wireless signals), ambient intelligence, ubiquitous computing, human-computer interface, network software development, and any other type of digitalized (audio or visual) communication.

The success of the Egypt case is not merely the application of social media, but a complex communication infrastructure set up from things as macro as global navigation satellite systems, cable towers, wireless access points, and local data centres, to the development of micro computers, handheld electronic devices, digital networking services, and software algorithms. The social revolutions of the twenty-first century not only involve mass mobilization and regime change, but also directly promote a series of fundamental techno-social advancements and expansions (fig. 1.04.).

This thesis takes the incident in Egypt as a point of departure, and aims to investigate the architectural response influenced by the techno-social transformation in contemporary cities.



Figure 1.05

"Really", TV advertisement for Windows Phone 7. Mobile phone is one of the information technologies that influence our behaviour in both public and the private spaces.





The New Roles of the Urban Private and Public Spaces

“Public Space, in an electronic age, is space on the run. Public space is not space in the city but the city itself. Not nodes but circulation nodes; not buildings and plazas but roads and bridges. Public space is leaving home and giving up all the comforts of the cluster-places that substitute for the home. Space on the run is life on the loose. There’s no time to talk; there’s no need to talk, since you have all the information you need on the radio you carry with you. There’s no need for a person-to-person relationship, since you already have multiple relationships with voices on your radio, with images of persons in store windows and on billboards. There’s no time to stop and have a relationship, which would be a denial of all those other bodies you’re side-by-side with on the street, one different body after another, one body replacing another... You come to visit, not to stay.” (Acconci, 2009, p.82)

Vito Acconci, published in: Critical Inquiry 16. University of Chicago Press.

As a developing country, much of the older and poorer populations in Egypt are still unfamiliar with information communication technologies (ICT). On the contrary, the digital network and the intelligent electronic devices in the developed countries have already infiltrated most aspects of our lives and across most age groups. In 2010, 77.7% of the total population in Canada used the internet, compared with only 24.5% of the population in Egypt (Group, 2010) (fig. 1.04.). Here in Canada, rather than a tool facilitating political uprisings and nation-wide revolution, ICT is shaping a different kind of urban phenomenon – one that is blurring the line between the public and the private spheres.

In developed countries, the contemporary private sphere is no longer the primary place for (personal) retreat. Inside most modern homes, mass media is not only carried by cable television and newspapers; internet

streaming videos, online stores, virtual community, and tablet computers are now introducing many public spectacles into our own private domain. The notion of how we relate to one another in our plurality by simply watching people on television screens (or making telephone calls) is outdated. Instead, we are now able to separate ourselves from the physical world and submerge into the virtual public space all from the comfort of our homes.

By introducing various levels of communication technologies into our homes (mobile devices, intelligent appliances, and interactive media), the private sphere in the contemporary city now also serves the function of what used to be the preserve of public spaces, such as schools, offices, markets, or even hospitals. At some point it might even operate as a street, where we can enjoy aspects of street life such as shopping, socializing, touring, people watching (or stalking) at home.

However, the internet and all of these spectacular technologies come at the cost of redefining privacy and the traditional private sphere. What used to be the “secret chamber” or “private getaway” no longer applies. Your behaviors in the cybernetic world are often saved within the database somewhere else. When our habits, interests, and behaviors are now recorded and open to the public (in fact, most of the time our private information is opened to the private corporations for commercial purpose, only in a few cases that it is used by the public – i.e. government or police investigation), our private domain is no longer the place to take refuge. Metaphorically, we are living in the apartment buildings depicted in the Jacques Tati movie *Playtime* (fig. 1.06.).

On the other hand, the nature of urban public space is also changing due to the emerging communication technologies. With the help of mobile electronic devices, pedestrians on the street are able to organize space, time, and the boundaries around the body in any public space. In one example, a portable audio player not only allows the user to personalize the experience of the city (by inserting soundtracks), but also to turn off any public interaction by simply wearing ear-buds (fig. 1.07.). In another example, the mobile phone, aside from its basic function of voice communication, has also become powerful at receiving and computing data



Figure 1.06

A scene in the movie *Play Time* (1967). The story is set in the futurist Paris constructed with modernist glass and steel highrises. This sequence was filmed from the street perspective, looking into residents' private space through uncurtained floor-to-ceiling glazing.

Figure 1.07

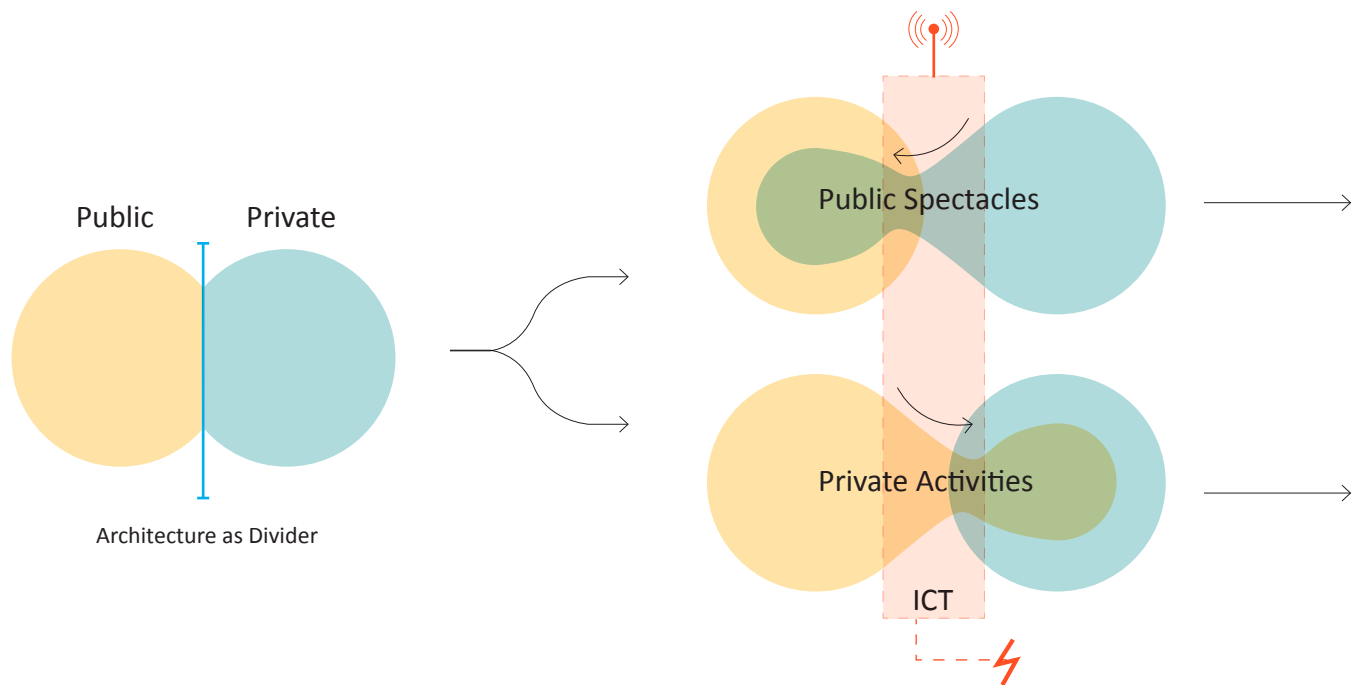
A scene in the subway where commuters create their own “private bubbles” by wearing earphones. It allows them to customize their experience through the city and also discourage public interaction.



information – namely wireless internet and location-awareness software. In another words, it now offers “ambient informatics” which refers to a state when information is freely available at any point in space and time (Khan, Scholz, & Shepard, 2007). Googling the rating of a restaurant and its address on the run is fast becoming the norm. Here, digital information is no longer restricted through a station. As a result, our behavior as we move through the city is not only dictated by the surrounding physical infrastructure, but also very much influenced by the digital network.

To a certain degree, the mobile phone has become a personal “territory machine” capable of transforming any public space into one’s private domain. If you go to a plaza or a square today, you will see many individuals either listening to their audio players, texting messages or using a cell phone, while all sitting closely side by side with minimal interaction with each other. Compared with the traditional plaza in past centuries, contemporary urban public space is no longer the only place for “public engagement” and “public opinion” – instead, it is populated by individuals who just happen to use that space for the purpose of self-interest (fig. 1.05.) (Habermas, 1991).

When public voices are formed more through the cable and the digital networks, people are connected through the internet rather than the street. Like the internet blockade in Egypt, do we really need to shut down an entire digital network in order to bring the public spirit back out on the street? Sidestepping this extreme approach, how should the physical urban form adapt to the emerging information technologies and the digital network in order to resurrect the physical public space once more?



The Intent of the Thesis

Our experience of the city, private or public, is no longer primarily influenced by physical built form but by various media, digital information, and communication technologies we interact with and through on a daily basis. The shift in influence not only blurs what used to be the public and the private space, but also modifies our behavior through space and time.

Our city today is no longer being recognized in terms of a strict dichotomy (public or private), but rather a continuity or a gradient of digital information flow. The function of architecture should not be confined to serve to provide shelter and integrate spaces, but should also morph in support of this digital transformation. Due to the technological advancement, the experience of an individual is no longer dictated by whether he is at home or on the street; one can be on the street and perform domestic affairs through cybernetic network, or at home enjoying street activities through digital media. The increased flexibility of our city experience creates a reversal in our definitions of public and private spaces; whereby the private domain is not strictly about maintaining privacy anymore, and the public space is progressively lacking more public interaction and participation (fig. 1.08.). Conceptually, when the public and the private spaces dissolve altogether completely, they both cease to exist. It is this undistinguished state of spatial boundaries that I am interested in exploring: how might

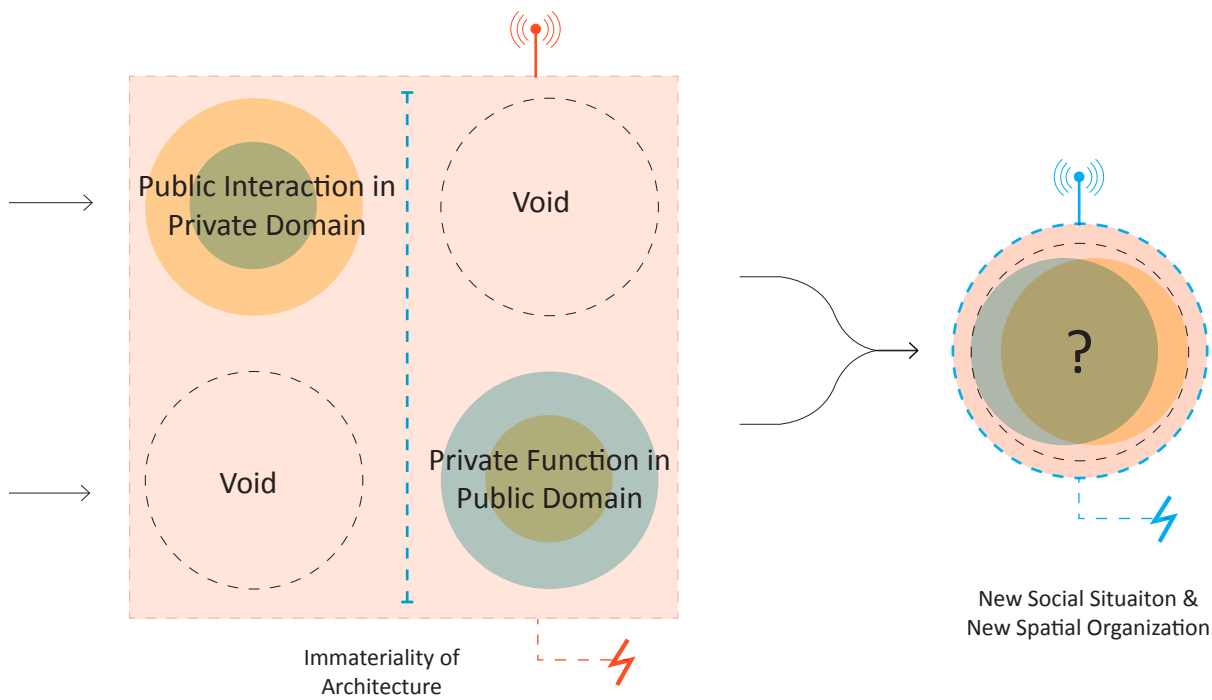


Figure 1.08
Parti Diagram.
(diagram by author)

built form evolve to accompany both the technological upgrades and the social changes?

Along with some of these technological transformations come with new social situations, and with them new spatial practices will emerge. Precisely for this reason, I want to find out the trajectory of the current social situation influenced by the information communication technology, and how it might alter future spatial organization both at the urban scale and the human scale.

The aim of the thesis is to raise questions and also to provoke discussion of the relationship between cybernetic public space and physical public space. The methods of investigation not only involve theoretical research, but also experimental design of architectural scenarios, particularly inspired by such visionary architectural projects influenced by a set of particular technologies (Plan Voisin by Le Corbusier; Plug-in City by Archigram; Soft Babylon by Marcos Novak) or that acted as critiques of the social consequences (New Babylon by Constant Nieuwenhuys; The Continuous Monument by Superstudio) (fig. 1.09.) (see appendix).

This thesis also aspires to continue the legacy of the avant-gardes and to carry on the optimistic approach and explore new architectural opportunities in the future of the digital networked world.



Figure 1.09

Types of public space that confront different cultures, ethnicities, ideologies, and technologies.

The Research Questions & Thesis Framework

To begin the research, a series of questions are raised to identify the focus of the study and also to establish a framework for the thesis.

I begin by asking myself: when the city is no longer constrained by time and space, private and public, inside and outside, real and virtual, physical or digital, what does it mean for architecture? Throughout history, urban public space took on many different forms affected by various cultures, ideologies, and technologies (fig. 1.09.). How did public and private space in the developed world transform in different stages? When the future city is more about the overlapping of the digital and physical connectivity and intelligent interactions (human and non-human), what will the role of architecture become? Because of communication technologies, how should built form respond to the collapse of distance and time? Will the notion of private and public space disappear altogether? If so, how would urban form evolve accordingly? Public spaces are places for communication between people and things. What kind of public spaces might emerge when newer communication technologies are able to bridge back the disconnected worlds of the digital and the physical? What kind of new digitally enhanced architecture would encourage public participation?

In Part One, I want to find out why we are so dependent on the information technologies that we created, and what are the new social situations facilitated by those newly invented communication tools. To start with the research, I need to first find out how did we, as a society and as



individuals, evolve through different stages of modern civilization? And through experiencing individualization and urbanization, what kind of social and technological artifacts (architecture and information communication technology) have we created to either protect us from our surroundings or enhance our ability to reach into the greater global community? What are the impacts of those new inventions on our behavior and our attitude toward the public sphere and the physical public space? Why many important sociologists blame on the digital media and the cybernetic network of subverting the contemporary public sphere? Why are we so dependent on the internet and the social network today? What might happen if the tool that we created completely consumes us, separates us from the physical reality, and traps us forever in our own fictional and virtual desires?

Part Two is to find out how might architecture, incorporated with ICT, resurrect the public space which consists of mainly autonomous individuals. If the dystopian digital world is about complete transformation from materiality to immateriality, could the process be reversed? To avoid a dystopian ending, how should architecture integrate with new types of communication technology in order to encourage public participation and reactivate public space once more? What are the current developing information communication technologies that might suggest materialization of the digital information? What kind of urban form would emerge? And most importantly, what might the new definition of the public sphere and physical public space become?



Urbanization and the Post-Information Age 3.0

“The urban is a machine that connects and disconnects, articulates and disarticulates, frames and releases.” (Kerckhove, 2001, p.18)

A study from the UN Population Funds shows that urbanization will only grow more rapidly in the future. The data indicates that in 2008 already more than half of the world’s population lived in cities. By 2030, the percentage of the urban population in North American countries will reach almost 90% (UNFPA, 2007).

In the future, it is most unlikely that the implementation of the information communication technologies will be successful in a place like Broadacre City (the concept designed by Frank Lloyd Wright in 1932, which illustrated that every household in the low-density city sat on its own one-acre plot of land). Instead, ICT can only flourish in a densely populated city where proximity, diversity, and competition are the major components of the economic engine (Khan, Scholz, & Shepard, Situated Technologies Pamphlet 1: Urban Computing and its Discontents, 2007). Urbanization is formed through individual and corporate efforts to decrease expense and time in commuting while improving access to employment, education, and lifestyle. In most cases, density results in better basic services such as healthcare and entertainment. Because of the cultural diversity in a city, collaboration and competition between various parties also generates positive (and sometimes negative) pressures that stimulate economic

Figure 1.10

Urbanization has become the norm in both developed and the developing countries. In the picture: apartments in Hong Kong.

growth. And precisely because of this rapid urbanization and globalization, information communication technologies are able to thrive since there is increased demand to be connected in this urban labyrinth (fig. 1.10.). As we will see in later chapters, ICT is not only a tool to connect people in the ever-expanding cities, but also acts as an organizational infrastructure to bring order and efficiency to the megacity.

On another note, the time frame of this thesis is set in the so-called “post-information age”. As vague as it sounds, the “post” could suggest anything that is after: what follows the information age? Or more precisely, how did we arrive at the post-information age? From where did we depart? To get a better sense of the post-information age, we need to trace back to the industrial age and onward to provide us with a clearer trajectory of the past, present, and future.

During the industrial age, the emphasis was on the overwhelming material wealth generated by the modern industrial steam engines. With the efficiencies of mass production – pioneered by industrialists like Henry Ford – bringing material prosperity to the people, we have come to define ourselves by the consumer products we purchase, the car we drive, and the house we live in (Andrieu, 2007). It is a period that brought us mass production, consumerism, and urban sprawl.

At the end of the industrial age, the middle class started to realize that the “stuff” that they purchased not only did not make life better, but actually damaged the environment in an irreversible manner. The period was replaced by the post-industrial age which privileges knowledge over material production. It marks a transition from the manufacturing-based economy to the information, service and finance-based society (Andrieu, 2007).

Born from the diminishing industrial age was the emergence of the information age. As the mass media and the internet thrived, we found that we could also satisfy many of our desires through the possession of knowledge and information. And when the internet gained its critical mass in the 1990s, the world arrived to the second generation of globalization (the first generation of globalization being the free trade and open global markets that characterized the 1980s) (Friedman, 2005). Just as the heart of the industrial age was the steam engine, at the centre of the information age were the information communication technologies which vastly changed how we do business, socialize, and entertain. Like the industrial age which was about material wealth, the information age was about information wealth – more television channels, more e-mails, more telephones, more websites, more advertisement and more mass media. We invested in creating major network infrastructure at the beginning of the '90s hoping to create a world that has unlimited potential for information flow (Friedman, 2005). Unfortunately, the optimism brought by the new information technology also led to the speculative bubble of the rapidly growing stock market in the IT sector (Dot-com boom), only to be crashed by the real world laws of economics at the end of the decades (Manovich, 2005).

With the bursting of the internet bubble in the late 90s, the post-information age emerges, when people have had enough of information bombardment. It is characterized by the provision of individually targeted, simplified, focused, and relevant information. Learning from past mistakes, internet companies realized that “more” does not translate into “better”. Google (2004), for example, stripped away all possible unrelated links, leaving only our inputs in the search engine (unlike Yahoo or MSN which have everything displayed in their index pages). The straight-forward, simplified interface and the accurate calculation of the search outcome



Figure 1.11

The diagram shows the progression of the post-information age. Each stage has a specific characteristic associated with how we process digital information and also why we obtain it. (diagram by author)

emphasize the nature of the current post-information age. Let's call it Post-Information 1.0 (fig. 1.11.).

However, the post-information age that we are experiencing now is only the tip of the iceberg. A transition is quietly progressing and changing how and what kind of information we collect, process, and distribute. We are about to leave a world with too much useless information (unrelated consumer product advertisement and paparazzi) and enter a world with more useful information available only when one needs it (digital navigation and ads-free search engine).

Welcome to Post-Information 2.0. The goal is to have information retrievable whenever, wherever, and however – just like air. Described by Adam Greenfield in an interview about urban computing, "ambient informatics is a state in which information is freely available at the space and time someone requires it, generally to support a specific decision" (Khan, Scholz, & Shepard, Situated Technologies Pamphlet 1: Urban Computing and its Discontents, 2007). Developed further, the digital information will also be "location specific". Unlike the virtual reality which implies disembodiment, locative digital media is closely related to the physical body and the surrounding space. This opens up a whole new territory since the real world that we conceive now can be overlapped with unlimited layers of information and networks.

The goal of Post-Information 2.0 is to think about how space, location,

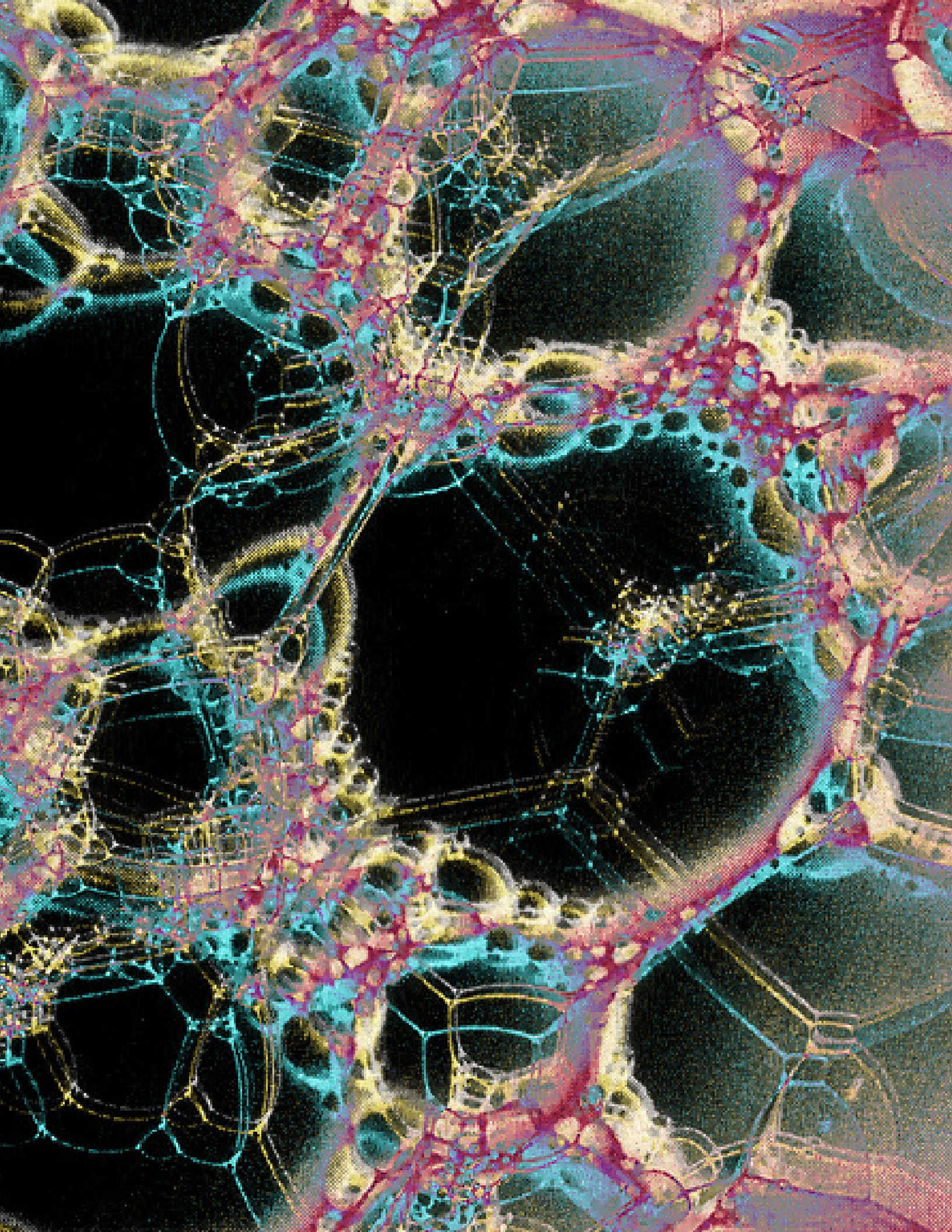
Figure 1.12

AmsterdamREALTIME. Over a 2 months periods, around 60 local Amsterdam residents generated this map by carrying GPS tracer that records each individual's movements in the city. The data is sent and compiled in real-time to an exhibition space, where movements are visualized to form a new kind of map of Amsterdam. Instead of streets and buildings, the collective's information is essentially the key factor to generate what could potentially be a useful resource for the public.



geography, digital information, physical and digital networks can come together and generate new knowledge and new experience for existing cities. To a certain extent, however, the characteristic of this stage is centralized around an individual; what I want, what I experience, and how I feel. As we will see in the later research many of the recent information technologies play an important role in supporting individualization and fragmentation.

Finally, what might be the Post-Information 3.0? Would individuals, having the freedom of possessing any information from anywhere, become even less concerned about other people? With the help of emerging information technology, would there be even less interaction between one another? Or on the contrary, could the information technology at this stage be combined with architecture, to encourage more public participation? In one example, a project called AmsterdamREALTIME collects data of people's movement while travelling through the city, and uses them to map out a new kind of cityscape (fig. 1.12.). With the help of data sourcing from collective people, could architecture ignite more physical public interactions by responding to the information emitted from group of individuals?



Chapter 2

The Foundation of Social Theory

Evolution of the Urban Social Transformation

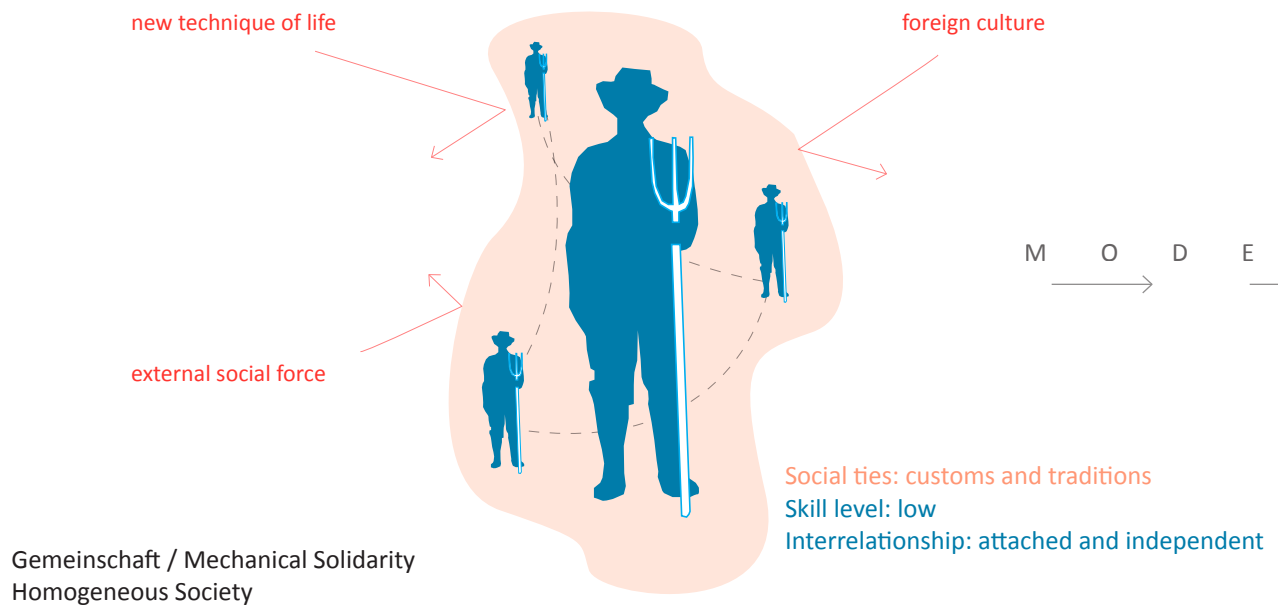
Before the invention of the internet, television, or even the telephone, our society had already undergone a series of transformations. Identifying the stages of transformation will provide insight to predict how the future society might behave.

At the beginning of the twentieth century, as people started living in denser cities and encountering ever increasing numbers of strangers, how did city dwellers respond to the growing physical and psychological pressures that ultimately influence their intrapersonal attitude and interpersonal connectivity? New definitions of the public and private spheres emerged as a result of external forces such as technology, culture, ideology, and politics. How should we describe these new social tendencies which are linked to ever-expanding global communications, and which also created the corresponding private-public space?

Figure 2.01

Today's society is described more as co-isolated bubbles rather than a conventional mass of people. As a result we create information communication technology and also architecture in order to sustain this type of society.

A new type of social solidarity emerges to accommodate trends such as individualization, fragmentation, and differentiation. If the ties between people from before the industrial age are portrayed as open, attached, and passionate, then the encounters in the city today are described as isolated, impersonal, and reserved (Avermaete, Havik, & Teerds, 2009). In the city, frequent interaction in the public space does not always lead to real sociability, but mostly involves monetary transaction and exchange. Compared to a rural village lifestyle, there is no sense of community in the contemporary apartment building, yet the digital connectivity is only



growing denser and much more complex. The contemporary city dwellers are physically closer to one another and yet the feeling of separation in public space is only getting stronger...

This chapter investigates why we are so dependent on information communication technology in order to be connected with one another in the digital age. We will find that it is not just a tool for communication, but also an infrastructure developed for strengthening of the contemporary social cohesion and solidarity.

From Mechanical to Organic Solidarity

The German sociologist Ferdinand Tonnies explains how urban social transformation developed. In his book *Gemeinschaft and Gesellschaft* of 1887, Tonnies provides insight on the evolution of social structure, and classifies two types of social organization – *Gemeinschaft* and *Gesellschaft*, the former acting as a relatively primitive society and the latter as the more developed social structure (Tonnies, 2001). In *Gemeinschaft*, people

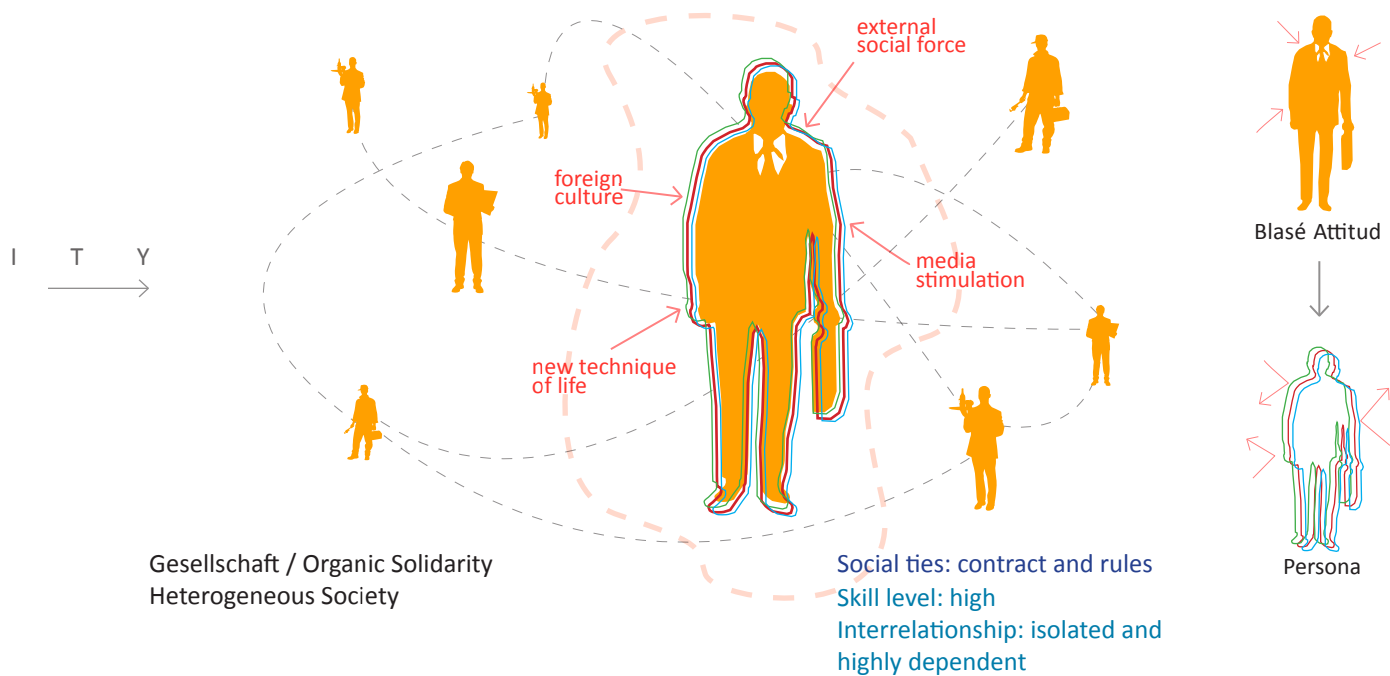


Figure 2.02

The diagram shows how the society evolves from Gemeinschaft (community) to Gesellschaft (society) and the changing nature of a person's interrelationship with others. (diagram by author)

live peacefully alongside one another, but without being essentially united. They are assimilated at birth by customs and traditions of their Gemeinschaft. Their actions are devoted to serve the community and hence individual interests are irrelevant and unnecessary. According to sociologist Emile Durkheim, this type of society is described as "mechanical solidarity" (Avermaete, Havik, & Teerds, 2009). The individual character remains dependent on a homogeneous group identity (fig. 2.02.).

With the rise of modernity (economic and technological growth), Gemeinschaft slowly evolved to become the second association, the Gesellschaft. In Gesellschaft, people remain separated in spite of everything that unites them. According to Tonnies, The relationships between individuals here are not founded on any fundamental connectedness, but on contracts and abstract rules (Tonnies, 2009). Everything is expressed in monetary terms. Urban life is involved in a society based on money and contracts (fig. 2.02.). Based on this observation, Durkheim also points out that because of modernity, the traditional "value patterns" can no longer serve as the underpinnings of society (Avermaete, Havik, & Teerds, 2009).



“The increasing process of specialization of social roles, professions, and occupations that is characteristic of modernity precipitates changes in ethics.” (Avermaete, Havik, & Teerds, 2009, p.23). The traditional collective definition of social ties gives way to individualistic solidarity.

Durkheim described this type of society, or *Gesellschaft*, as an “organic solidarity” which is also superior to the previous “mechanical solidarity”. This more developed society is constituted by heterogeneous individuals whose roles are similar to various organs in a body, each of which is assigned to a highly specific function, and each of which need other organs to survive as a whole (Avermaete, Havik, & Teerds, 2009). Take lawyers for example; one cannot simply replace the function of a lawyer with anyone else. A lawyer would not know much of the things other than his professional knowledge (he would not be able to fix a car). In a village or a small town, on the other hand, one learns various skills in order to be more independent, however, the acquired skill levels are usually more basic and faster to master (a farmer might also be a weaver, as well as a carpenter).

In his essay *The Metropolis and Mental Life* of 1903, sociologist Georg Simmel suggests that individuals in the urban context fight for autonomy and individuality of their existence, while facing and digesting social forces individually rather than as a collective group. “The psychological basis of the metropolitan type of individuality consists in the intensification of nervous stimulation which results from the swift and uninterrupted change of outer and inner stimuli”. (Simmel, 2000, p.142). Simmel also suggests that city life gave birth to a mentality called the “blasé attitude”

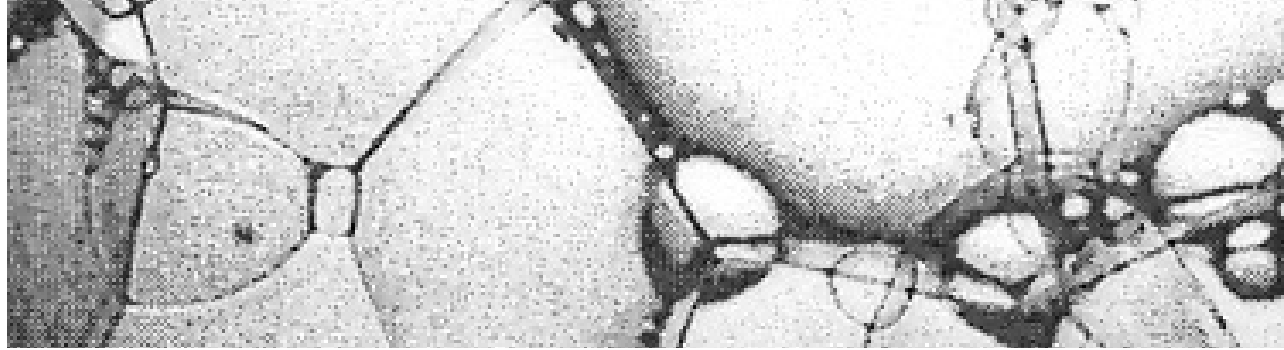
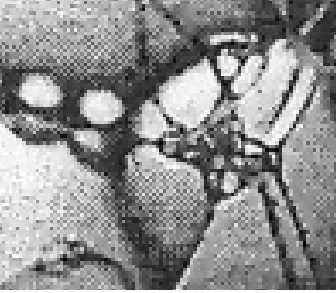


Figure 2.03

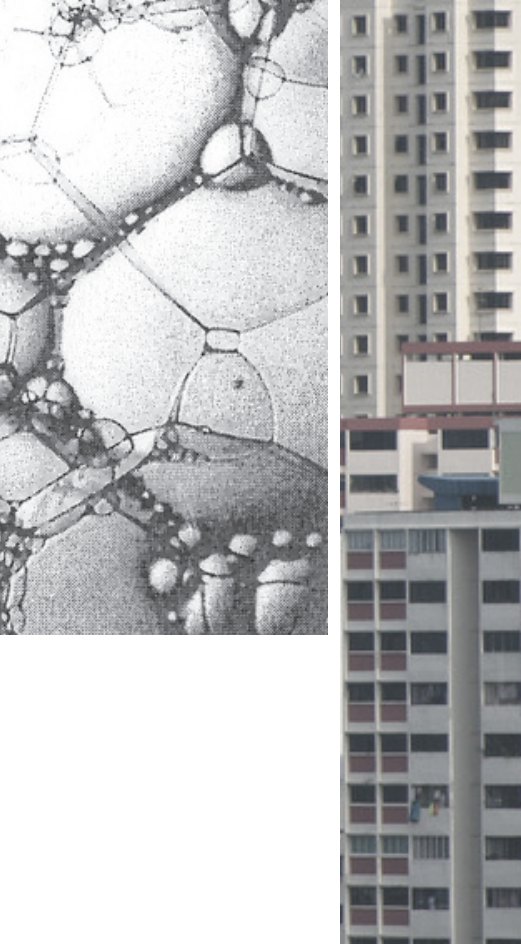
"Foam City"

which, in summary, protects a person's inner self from excessive stimuli encountered in the urban environment, and thus creates the impression of impersonal and reserved interaction in the urban public space (Simmel, 2000).

Because of the "blasé attitude", metropolitan dwellers develop a defense mechanism to adapt their mindsets in response to various situations. The purpose is to hide one's true inner disposition. As a result most of the urban interactions imply role playing in a particular situation, not true sociability (shoppers in the mall or subway passengers). As the sociologist Louis Wirth puts it, modern society is the product of a complex interplay of roles (Avermaete, Havik, & Teerds, 2009). Consequently, a person can seamlessly move from one social group to another while behaving differently in each one without anyone noticing the difference.

This social tendency also relates to the term "persona" (fig. 2.02.). Derived from Latin, persona means a character or social role played by an actor. In ancient Latin, persona also meant "mask" in the context of theatrical performance. Conceived by the psychologist Carl Jung, the term is also used to describe an individual's specific behavior to satisfy the demands of the situation by hiding the inner personality. It is an invisible social mask that we all wear in a "Gesellschaft", in order to fit into a city already saturated with multiple cultures, traditions, ethnicities, races, and media.

The persona is a response to the "blasé attitude", protecting the inner self with social appearances against external forces (fig. 2.02.). However, the protective mental barriers isolate us from everyone else in the physical world. In order to avoid the collapse of the Gesellschaft, individuals need more than just contracts and abstract rules. They need to find more



intimate methods to express the inner feelings and more direct channels to connect the drifting bodies in the growing urban jungle – hence the creation of the information communication technologies, which fit perfectly into the dense apartment living style and also with the constantly moving city nomads (fig. 2.04.).

In his essay *Foam City* (2008), the contemporary sociologist Peter Sloterdijk articulated his interpretation of this social transformation. He indicated that the concept of masses today, or gathering of collective individuals to form accumulations, is radically different from previous societies. If the concept of masses from before relates to a collective entity like dough, sand, or bags of potatoes which often leads to harmful and irrational ideologies (mobs, riots, and violent revolutions), then today our urban society can be compared to foam bubbles (fig. 2.01. & 2.03.) (Sloterdijk, 2008).



Figure 2.04

Because of the changing interrelationship between people, we develop communication tools to allow us adapt the new social situations created by modernity and urbanization.

“The co-isolated foam of society conditioned to individualism is not simply an agglomeration of neighboring (partition-sharing) inert and massive bodies, but rather multiplicities of loosely touching cells of life-world, each of which, by reason of its own inner expanse, deserves the status of a separate universe” (Sloterdijk, 2008, p.64).

Because of communication technologies, we are able to break free of the physical constraints of our bodies and be at several places at once, or even control the perception of time. However, Sloterdijk points out the precautionary effect of the foam city. Even within an insulating medium, due to the transparent nature of the bubbles, there is not much substance to protect the private domain (Sloterdijk, 2008). In the digital age, it is not unusual that someone (or something) somewhere is aware of your activities in the private domain.



The Tools that Shape Us

“In an electronic age, one has all the information of the city at one’s fingertips, on a computer terminal, in the privacy of one’s own home” (Acconci, 2009, p.80).

Information communication technology plays a major role in reinforcing contemporary social structure. To the city dwellers who encounter the “blasé attitude”, information communication technologies are the remedy to stay connected in the sea of urban high-rises. It is not only the significant tool to distribute social networks throughout the globe, but also the catalyst for individualization in the urban context.

In an interview with Peter Sloterdijk published in *Frieze* magazine (London), he shares his insight on the social effect of the contemporary communication technology and the urban built form:

“An apartment is obviously a place that contains the means of communication to link you with the outer world, yet it is also a spatialized immune system. It immunizes you against the influence of the outer world but it simultaneously links you to the Mitwelt (social world), which is a form of “connected isolation”... for me, practical metaphysics has to be translated into the language of general immunology because human beings, due to their openness to the world, are extremely vulnerable – from a biological level, to the juridical and social levels, to the symbolic and ritual levels.

Figure 2.05

The tool that we create for us to counter the blasé attitude now allows us to further escape into the simulated world, separated from actual reality. (image by author)

We are always trying to create and find a protective environment”
(Morse, 2009).

When the city becomes ever so dense, one could encounter hundreds if not thousands of strangers every day (taking into consideration the people we see from all types of media). We invented ways to stay connected in the network of friends and family even if they are scattered across the globe. Communication tools, in this case, are not only the immune system that creates a protective environment but also the essential tools to survive in the city. To become “off-grid” in an urban environment is nearly impossible. To live without it is the same as a diver without an oxygen tank or a traveler without a water bottle.

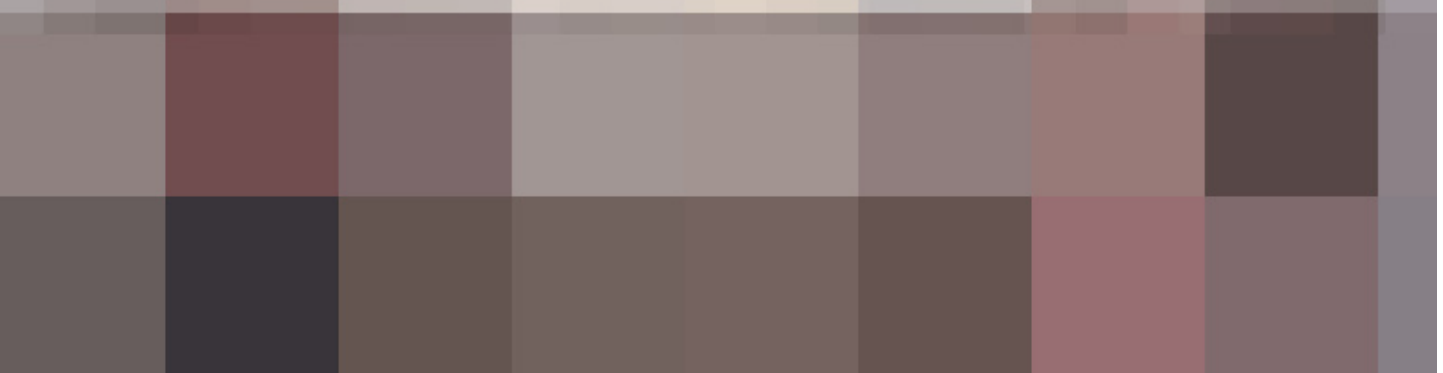
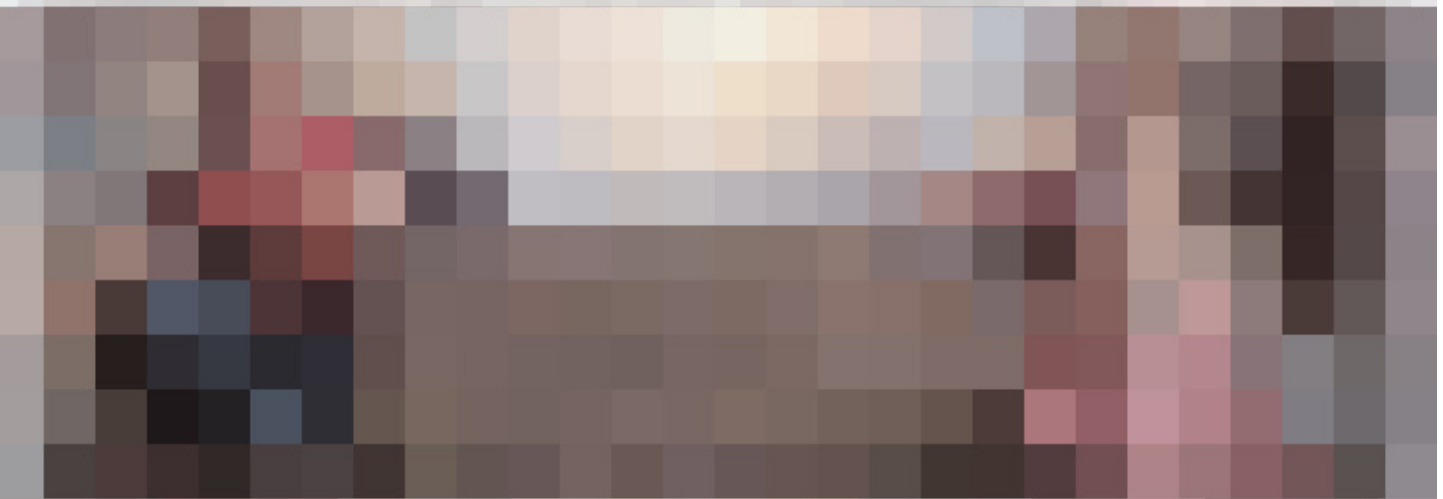
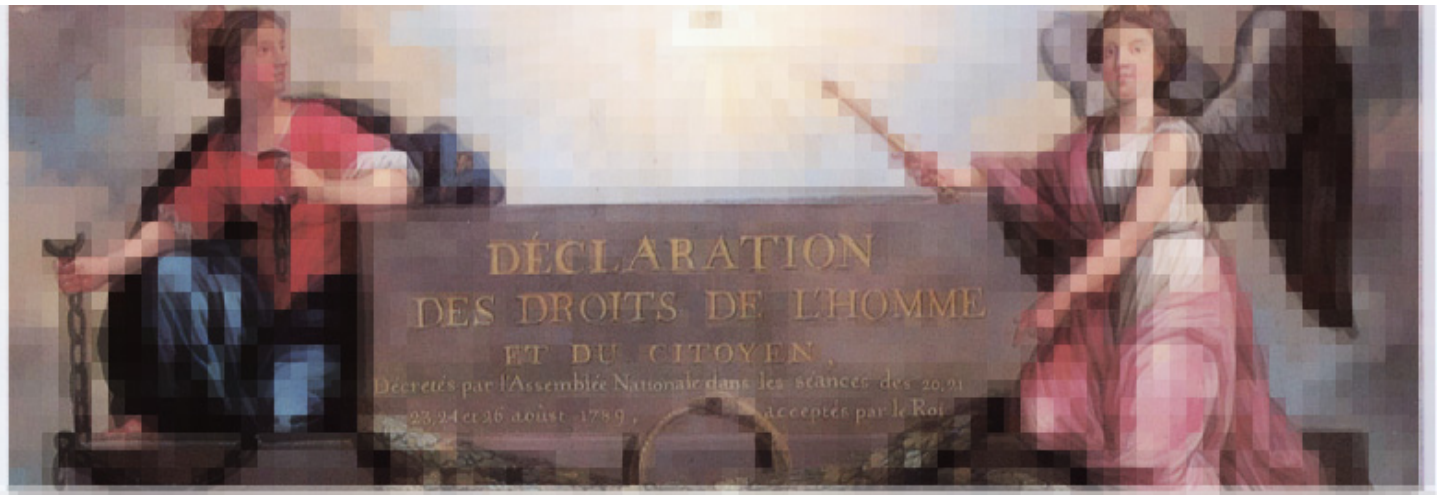
Marshall McLuhan, a media theorist in his book *Understanding Media: The Extensions of Man* (1964), indicates how the major artefacts (be they cultural, mechanical, or digital) that we create would generate new social effect and change the way we live (McLuhan, 2001). He uses the phrase “we shape our tools and thereafter our tools shape us” to explain how we create media as means of communication, and eventually this affects the behaviour of the people who are often involved with this medium. McLuhan’s argument also points out that a medium influences the society in which it plays a role not by the content it delivers, but by the characteristics of the medium itself (McLuhan, 2001). For this reason, it does not matter if the television is broadcasting commercialized and privatized media or a political announcement; the effect over the society would be the same: it plays an important role in establishing social cohesion by relating viewers with the people onscreen, not by conducting physical interaction with others outside of the house. Mass media

became the “immune system” for the isolated individuals to get adapted to urbanization and individualization. In the digital age, we relate to our plurality through mass media instead of mass crowds.

In a way, architecture is also a type of communication tool, one of the oldest ever developed. We design buildings not only to provide protective, useful, or aesthetically pleasing spaces, but also to record, store, and emit information for the local users or passersby. However, architecture’s way of delivering information is constrained by its static nature, and therefore cannot surpass the dynamic and immaterial digital information technology. If the social infrastructure from before consisted of physical public space that welcomed public interaction and debate, the contemporary social infrastructure is found in digital space. Due to the physical constraints of architecture, most people choose to connect and be connected through the virtual network, engaging public affairs in digital space rather than through the physical public space.

When computing technology progressed further during the 1980s’, yet a new level of intimacy can be found through the combination of the digital network and virtual simulation. Instead of passively watching and observing images of people onscreen, the internet and virtual reality allow one to be fully submerged inside cybernetic space. In a computer-simulated environment, you are your avatars which can only take shape inside the virtual world (fig. 2.05.). Your “persona” literally takes on various forms and can be projected onto the computer screen at home. Friendship, family, work, shopping, getaway, or love, anything that happen in the physical world could be simulated in the virtual reality at one’s fingertips in the comfort of home.

In a way, virtual reality and the disembodiment of the self is the most extreme portrayal of the “connected-isolation”.



Digitization of the Public Sphere

“The Internet and the Web are My-Way media, and it doesn’t matter how much of cyberspace is occupied by business or government, whatever forms these take in the future, or how much smut there really is on-line or how many Intranets are preventing my access to whosoever. What matters is that as long as there is that public space out there, that public cyberspace, something that we all share and that has infinite expandability, we will always have a room there, a position and a reality that depends only on us.”

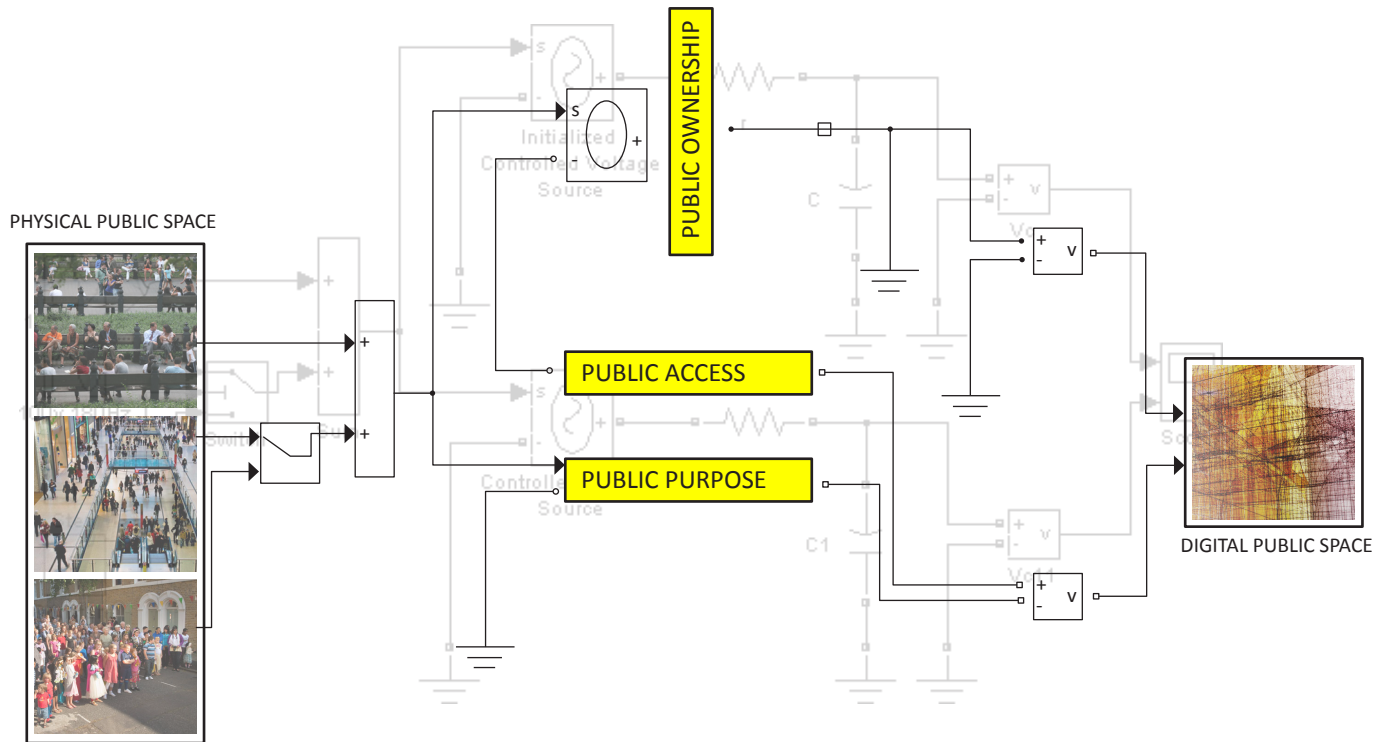
“Cyberspace is public space” in *Architecture of Intelligence* (Kerckhove, 2001, p.27)

Figure 2.06

The progression of digitizing the picture of *Declaration of the Rights of Man and of the Citizen* which was created in 1798 in Paris during the French Revolution to address the definition of the private and public space. (image by author)

Thanks to James Clerk Maxwell who formulated electromagnetic theory, the telegram was invented at the beginning of the nineteenth century. For the first time, people could communicate over long distances almost instantaneously. Instead of messages being delivered in a few days, users could now broadcast information in matter of seconds. This changed everything, including how interpersonal relationships operate and the how the conventional public and private spheres are defined.

How the public and private spaces are formulated in the city reflect the ideology of the local governance. Since the Age of Enlightenment, the public sphere of contemporary western cities has been characterized as a place where freedom of speech and public opinions are generated (Avermaete, Havik, & Teerds, 2009). However, when decidedly more daily public



engagement is held through the communication network, contemporary urban public space is reduced to more of an ambiguous space. What are the fundamentals of the city when the public sphere is digitalized and freed from physical space? When more individuals are connected through the digital network and mass media instead of the street, what is the new ideology behind the city? We need to reinvestigate the very idea of what constitutes as “public” and find out the changing nature of public space.

Interestingly, if we look into the *Declaration of the Rights of Man and of the Citizen*, created in 1798 in Paris during the French Revolution, we can draw parallels between physical public space and cybernetic public space (fig. 2.06.).

Developed during the Age of Enlightenment, the Declaration defines a single set of individual and collective rights for all men. Stated in the declaration, an individual could formally own a plot of land and also have the freedom and right to set up rules within it, hence the creation of the private sector. The purpose for the private domain is for self-interest, not for collective concerns. In other words, the private domain is exclusive and the public domain is inclusive.

Figure 2.07


The diagram shows three major similarities between physical public space and digital public space.

(diagram by author)

More importantly, defined in the Declaration are the three divisions that form the fundamental backbone of public space: ownership, accessibility, and purpose (fig. 2.07.). In the legal term of “ownership”, any publicly owned space or building is included in the public sector. This includes streets, parks, and government buildings, which exist to serve collective functions. By contrast, the private domain includes private properties such as homes, shops, and offices.

As for accessibility, according to the Declaration, the public domain should be accessible to all, at any moment of the day. Anyone can use public space, up to a point. Until today, this principle has remained the same, where street, squares, parks, and other public spaces which are open to everyone are considered as a major part of the public sphere (whether they act as one is another story). Likewise, the internet offers great accessibility to all users, sometimes even exceeding the capacity of the physical public space because of the elimination of geographical and time constraints – local city dwellers use local public spaces, whereas everyone in the world can access the “internet space” at any time of the day (given that you have the tools to access it).

On the other hand, another way to identify whether a space is public or private is by looking at the purpose of the space. If the space is designed for collective interest, it is considered to be part of the public sphere; whereas space in the private sphere serves the interests of an individual or a private body (family or company). Similarly, cybernetic public space can also serve the same “public purpose”. Because of the powerful mobility and flexibility of network technology, a multitude of people can now be mobilized spontaneously to undertake political acts. Howard Rheingold, in his book *Smart Mobs*, illustrates the power of the mobile many. He explains how communication technology helped shape political organization in Manila, Philippines. In 1986, radio was a crucial means of rallying for political demonstrations which caused President Marcos to flee the country. In 2001, mobile phones, text messaging, and e-mail became the central mechanisms that gathered political power to overthrow the Estrada government (Rheingol, 2002). Finally, in 2011, digital social



network services, online multimedia sharing websites, and microblogging services helped the young Egyptians to overthrow ex-president Mubarak. Compared to the 1968 revolt in Paris, many young demonstrators in contemporary cities display and broadcast their political intentions in the “virtual public space”. Because of the information communication technology, the collective purpose of the public sphere has extended from local to global.

According to Emile Durkheim, social cohesion will never be eliminated through stages of transformation of the social solidarity. The one thing that has changed is the nature of interpersonal relationships (Avermaete, Havik, & Teerds, 2009). Adopting Durkheim’s thinking, the idea of the public and private spheres from the Declaration stay constant even if society experiences different stages of modernity. Under this context, the thing that has changed is our method of interaction in the digitizing public spaces.



Figure 2.08

An abstract vision of the digital space which includes both the public and private functions.

(image by author)

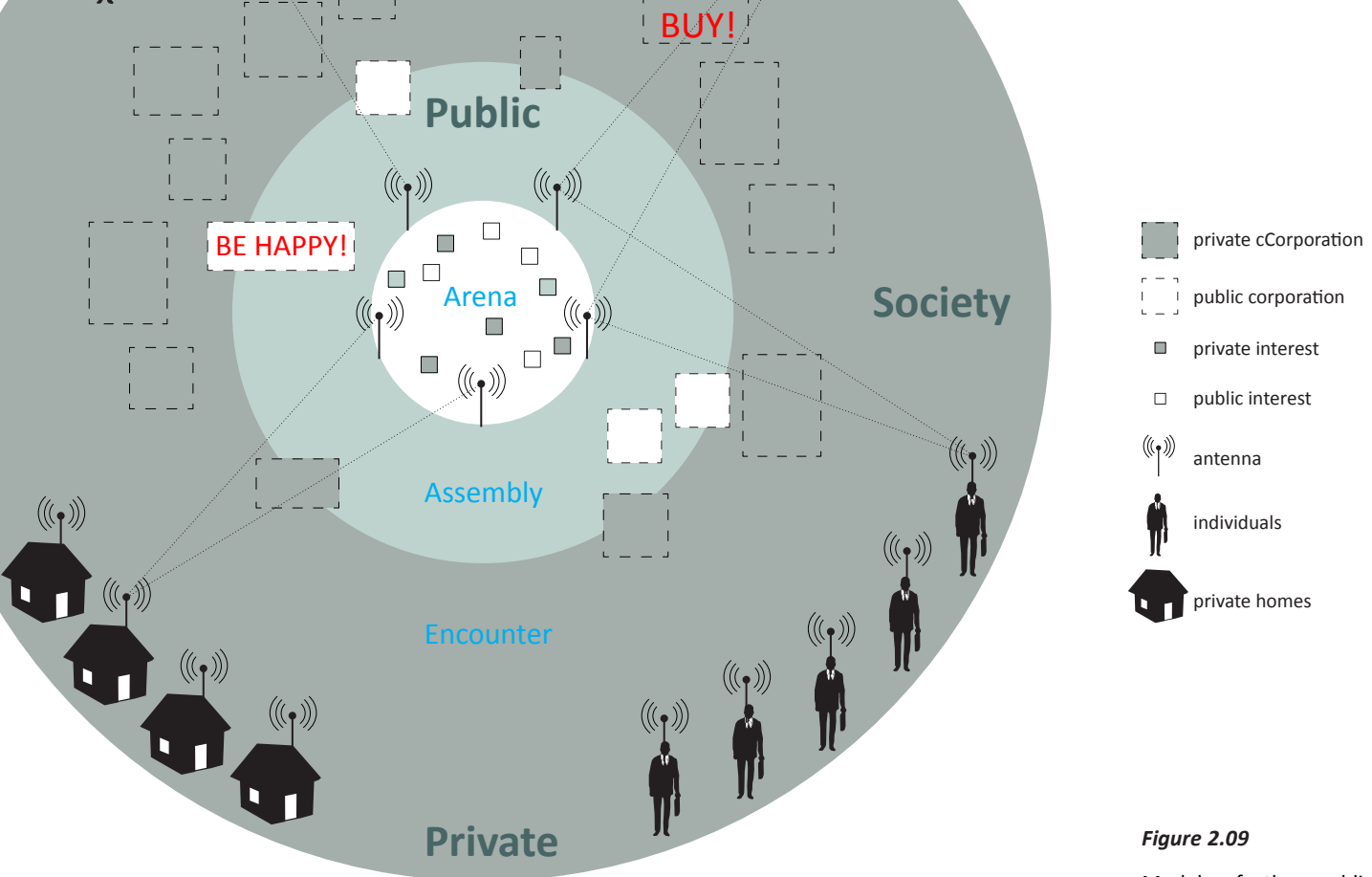


Figure 2.09

Model of the public sphere from mid to late 20th century when mass media and corporations manage most of the public sphere. (diagram edited by author)

Public Sphere in the New Media Era

A report published in the *International Journal of Strategic Communication* provides insights into the transforming public in the information age. By using diagrams, the report clearly illustrates the changing nature of the public sphere mediated by mass media and thereafter the internet from mid 20th century (fig. 2.09.) moving into the 21st century (fig. 2.10.) (Bentele & Nothhaft, 2010). Keep in mind that the diagrams have been modified for the purpose of this thesis.

In the model of the mid 20th century, the largest portion of the outer circle in dark grey represents our society. The smaller mid circle in light grey represents the public sphere, whereas the inner circle in white represents the core of the public sphere, also known as the “arena”. It is where public opinions are formed by a selected group of people or organizations. Inside the arena, debates and social topics (small squares) are formed in different levels: public interests such as climate concerns are represented in white

squares; private interests such as celebrity gossip stories in black squares; and anything in between (grey squares).

Private homes and individuals are located at the most outer layer of the circle in dark grey. Each of them contains a small antenna which constitutes mass media and mobile information communication technology. Before, only a few people knew the activities inside the arena. Now, with the help of the communication technology and mass media, everyone can be an audience without leaving their homes. In the late 20th century, the public sphere is ubiquitous (Bentele & Nothhaft, 2010). The activities inside the arena is happening somewhere else, but they can be experienced, as a media surrogate, everywhere else.

One aspect that people usually are confused by is that the ubiquitous public sphere does not mean that everyone experiences public affairs the same way. There are 3 levels of experiencing society – the encounter level, the assembly level, and the mass media (arena) level. Take the Egyptian protest in 2011 as an example; if an individual saw news reports on television about demonstrations on the street and decided to leave the house and take a look, he then experienced the public sphere at the encounter level. If the individual then participated in the demonstration, then he experienced the public sphere at the assembly level. One would only be experiencing at the mass media level if he is invited to a political talk show or appeared on an interview over the news.

The Egyptian instance is a form of public interest and would be represented in white squares. However, increasingly more information perpetuated by mass media is not pro-public interests but pro-private interests. Established by major corporations represented by the dotted grey boxes, the public sphere is now having to compete with other mass media content such as entertainment (Be Happy!) and commercial marketing (Buy!) (fig. 2.09.). In fact, the society prior to last quarter of the 20th century was dominated by multinational organizations (Bentele & Nothhaft, 2010).

However, with the invention of the internet in the late 20th century, the social structure and the definition of the public sphere gradually changed (fig. 2.10.). The major characteristic for this model is that the previous

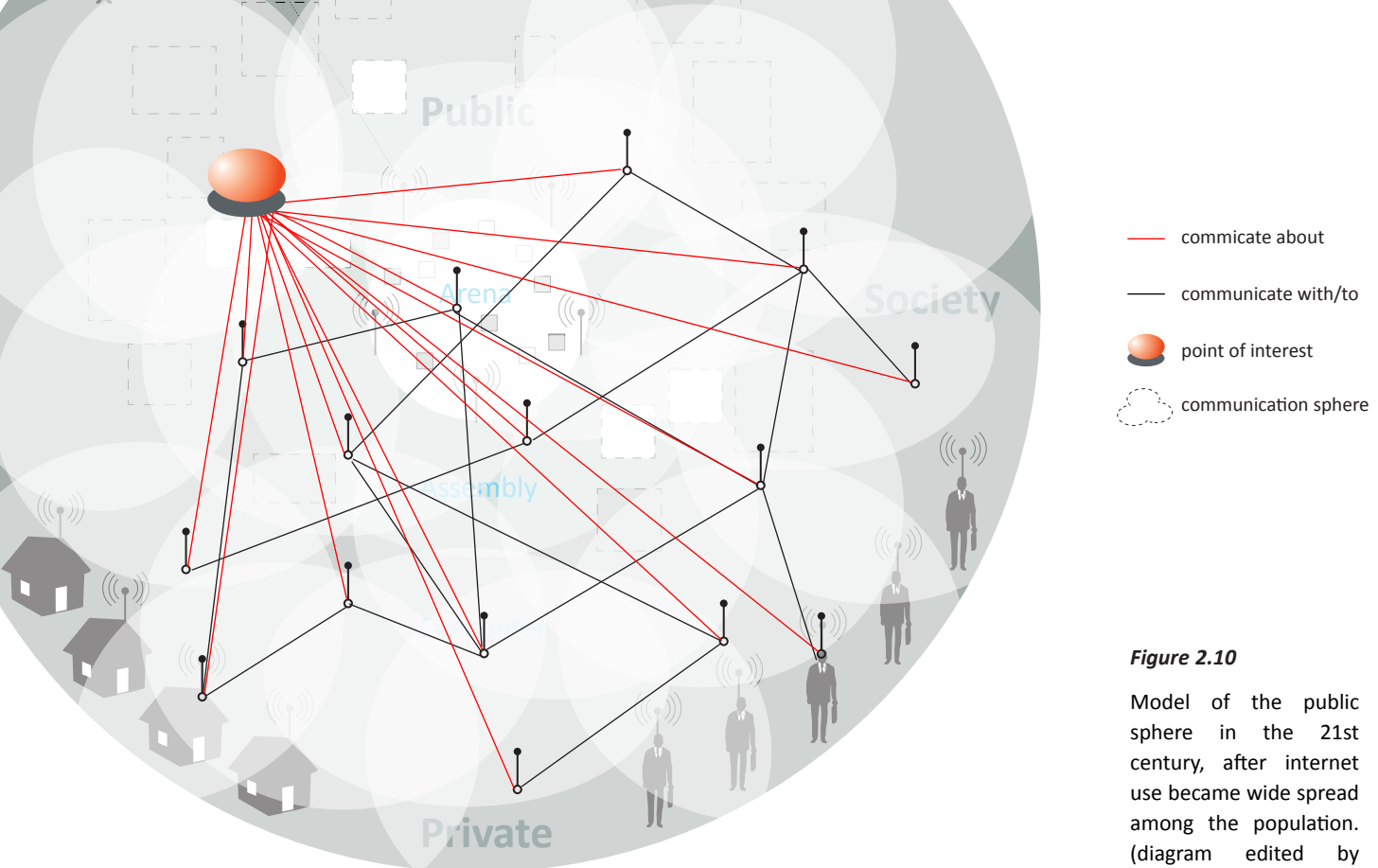


Figure 2.10

Model of the public sphere in the 21st century, after internet use became wide spread among the population. (diagram edited by author)

public sphere is now covered (but not replaced) by the new communication sphere which collapses the hierarchical and physical constraints even further (such as time, distance, or technical limitation).

It is no longer a force field of media attention constituted by a limited amount of actors. Instead, it is a network of points of interest (Bentele & Nothhaft, 2010). The network mainly consists of 2 types of communication; someone that you are communicating with or to (black lines), and the topic that you are communicating about (grey lines). The point of interest can be located anywhere in the society circle (fig. 2.10.), be it public incidents such as the revolt in Egypt or private events such as cancellation of a house party. Internet websites such as Facebook and Twitter are the major carriers in this case.

Consequently, with the emergence of new communication technologies, the public is revealed more as a process, a flow, and a flux of information, rather than an essence or a group of representatives. Ever since the mass media age, we cannot view the public as a static, physical form, but a dynamic and evolving process that is always changing from place to place, topic to topic.

Figure 2.11

Web Trend Map 4, by iA (Information Architects). The Web Trend Map superimposes the Internet's leading domains onto the public transit subway map in Tokyo. Every position of the domain is evaluated based on traffic, revenue, and character. The illustration represents a conceptual transformation between the digital public space over the physical public space.

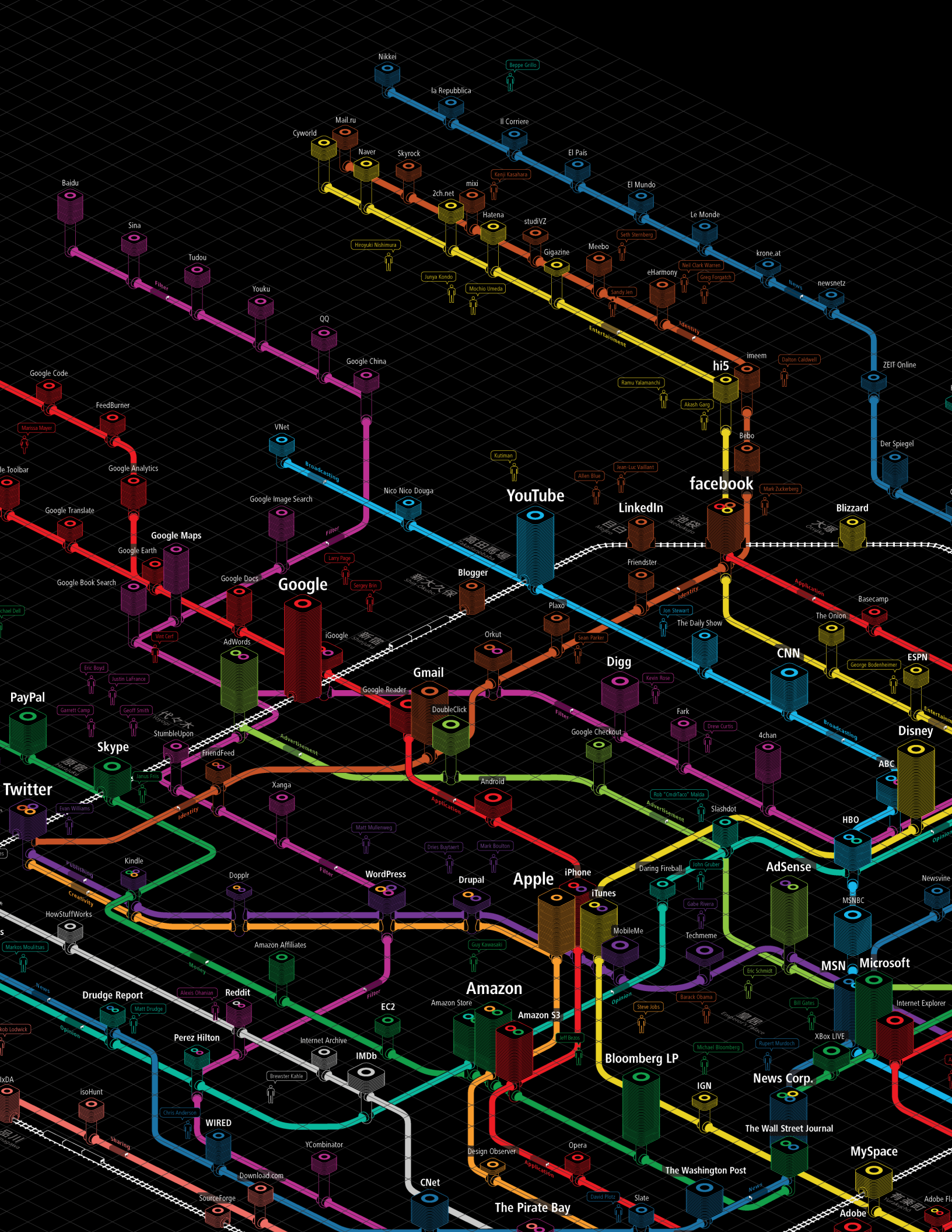




Figure 3.01

Web Trend Map 4, by iA
(Information Architects).
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previous page

Chapter 3

Subversion of the Private and Public Sphere

The Critique of the Social Theory and ICT

Contemporary Theories behind the Decline of the Public Sphere

The *Declaration of the Rights of Man and of the Citizen* is considered as a form of “natural law”, and also became the fundamental precedent of the International Human Rights Instruments adopted by United Nations in 1948 thanks to its unbiased position on neither religious doctrine nor authority. Consequently, the legal definitions of the public and private spheres have not changed significantly even in the rapidly growing cities today.

However, the theoretical debate concerning the public sphere was not always agreed upon. Philosophers and sociologists such as Jürgen Habermas, Hannah Arendt, and Richard Sennett raised concerns about the decline of the modern public sphere.

The famous book *Structural Transformation of the Public Sphere* (1962) by the German sociologist Jürgen Habermas makes an important contribution to the understanding of contemporary democracy and the formation of the public sphere. According to Habermas, the public sphere is a realm of social life in which something approaching public opinion can be formed, and in which citizens can confer matters of general interest in an unrestricted manner (fig.3.02.) (Habermas, 1991). In his theory, Habermas

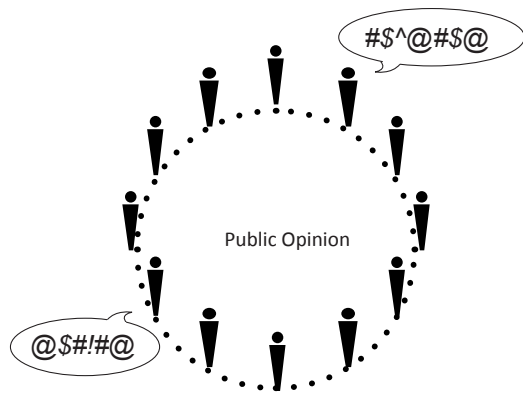
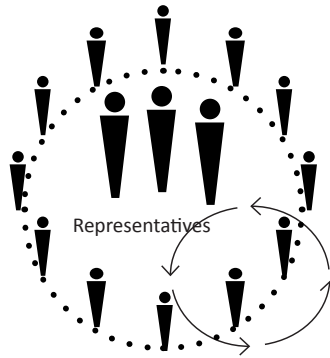


Figure 3.02 a

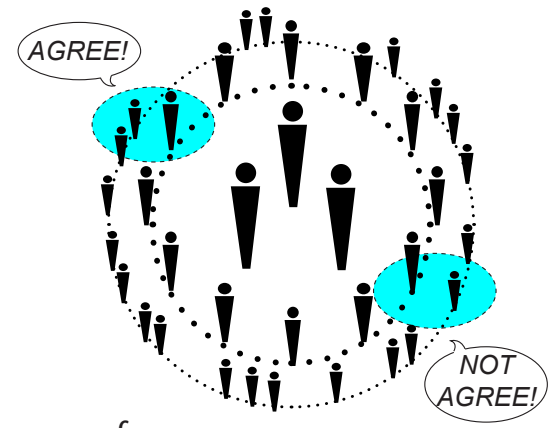
(diagram edited by author)

Habermas' ideal speech situation, where public sphere (the arena) is not dominated by people, but by arguments thrown into the ring.



b

Instead of pure arguments, larger-than-life individuals are located inside the arena. If one speaks up against a proposition, one speaks up against the man. Individuals inside and on the boundary are exchangeable.



c

Different than figure 1.8b, the public sphere now involves audience on the outer circle. The blue circles represent the congruence between the audience and the potential actors. Habermas refers these as the "public opinions".

explains that the rise of capitalism in the mid-sixteenth century gave birth to public power, which was later adopted by the new bourgeois class in the eighteenth century (Avermaete, Havik, & Teerds, 2009). The new bourgeois class, including scholars, doctors, and lawyers, formed the intellectual public sphere which was constantly undergoing refinement and modification. During this period, the main vehicle that delivered critical public discussion was through personal interaction and print media such as newspapers and books. Arguments and debates were held also in the newly emerged public spaces such as salons, café-houses, Masonic lodges, and clubs (the term "Pub" was short for "public house").

However, according to Habermas, critical public debate and the public sphere itself have been declining since the privatization of mass media (newspaper, radio, and television). Instead of broadcasting public opinions, mass media is now mainly used to perpetuate private and commercial interests. What used to be a vehicle for the public interest has now become a vehicle for the promotion of mass consumerism (fig. 3.03.). "The world fashioned by mass media", Habermas says, "is a public sphere in appearance only." (Habermas, 1991)

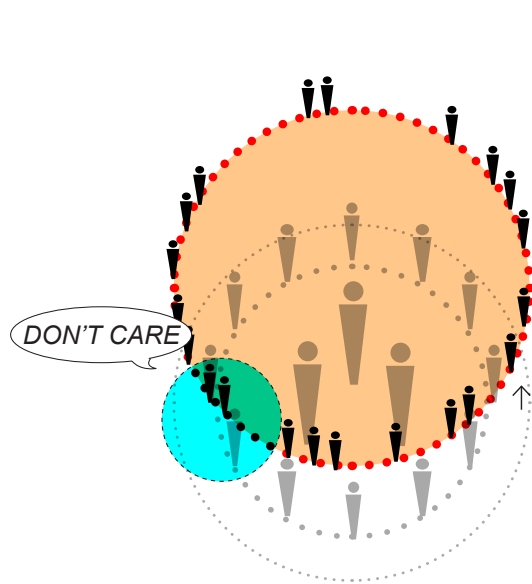


Figure 3.03

Habermas believes that public sphere is declining because the privatization of the mass media. Red dotted circle represent mass media and ICT. The orange shade represents private interests enhanced by mass media and ICT.

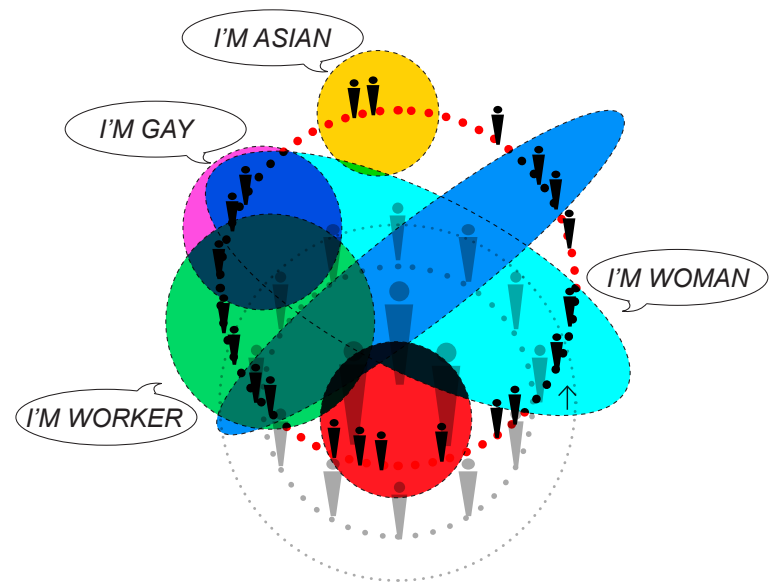


Figure 3.04

Because of mass media and ICT (red dotted circle), counter-public spheres are able to gain more power. However, according to Lofland, this also creates a public labyrinth.

Conversely, the same mass media that Habermas criticizes also creates the so-called “counter-public spheres” (fig.3.04.) (Avermaete, Havik, & Teerds, 2009). Despite the transparent and open image of the bourgeois public sphere, the main contributors of “public engagement” were middle class white men. Women, workers, immigrants, gays and lesbians were excluded from the conversation. With the rise of mass media and information communication technology, however, it is possible to bring together enclaves of or satellite “minority public spheres”. The effect of television in the early 1960s and the internet in the 1990s was to enable diverse sub-public spheres to expand, and eventually to compete with the mainstream public sphere. The diversification of the public sphere allows countless of smaller spheres to co-exist. According to Lyn H. Lofland in his book *The Public realm: Exploring the City's Quintessential Social Territory*, “the result is a public labyrinth, and whoever enters it immediately encounters particularisms of race, sex, sexual identity, age, ethnicity, and religion” (Lofland, 1998).

German political theorist Hannah Arendt has a different interpretation of

the public sphere based on humanity in general – her focus is on men, not man. In her book *The Human Condition*, Arendt uses Ancient Greece as the backdrop for her arguments and identifies three types of activities: labour, work, and action. Both labour and work are considered as events in the private realm: labour consists of never-ending repetitive activity that is necessary to sustain daily living, whereas work is similar to labour, the difference being that work generates an end product (eg., making a flute). Action, on the other hand, represents the public realm by acting and speaking freely in front of other people. “Action and speech create a space between the participants which can find its proper location almost anytime and anywhere” (Arendt, 1998). Keep in mind that the concept of the public realm in this case is freed by location of the space and class boundary, whereas in Habermas’ theory, the public sphere eventually projects itself into hierarchical physical forms.

Elaborating from Arendt’s theory, the public realm has the ability to emerge anywhere, even inside the private realm, as long as we are able to relate to one another in our plurality, with the aim establishing commonalities. This approach allows mass media such as television and the internet to serve as essential gateways to the public sphere within the private realm.

“It means first that everything that appears in public can be seen and heard by everybody and has the widest possible publicity. For us, appearance, something that is being seen and heard by others, as well as by ourselves, constitutes reality.” (Arendt, 1998, p.50)



Figure 3.05

(From left to right)

1. Jürgen Habermas, a German sociologist and philosopher who devotes his studies on theories of “communicative rationality” and “public sphere”.

2. Hannah Arendt, a political theorist who deals with nature of power, and subjects of politics, authority, and totalitarianism.

3. Richard Sennett, a sociologist who is best known for his studies of social solidarity in urban context.

However, according to Arendt, mass media accomplishes all of that except for one of the most important principles of public activity: creating a common world. As the power of the individual continues to rise, collective interests are seen as increasingly less important. And when the mass media is privatized, the potential for it to become a public vessel is defeated. Here in the contemporary cities, the individual is often caught up within his or her own desire, individuality, and personal experience.

The American sociologist Richard Sennett also comments on this “consumer reality” projected by the mass media. In his book *The Fall of Public Man*, Sennett claims that the false reality consisting of mass media controlled by capitalism and consumerism may have caused the subversion of the public sphere. According to Sennett, as more people were attracted to the intimate images on television produced for commercial purposes, more people abandoned the public domain and chose not to get involved (Sennett, 1992). In other words, the rising individualism in the city eliminated the social ties, or “civicness”, between people and communities.

This subversive tendency is also projected onto the architecture of the city. In the first chapter, “Dead Public Space”, Sennett describes the hermetic psychological state among the postwar International Style high-rises in New York:

Figure 3.06

“Transparent but isolated”, Richard Sennett describes this blurring of the public and the private through the use of modern building envelopes. Individuals in contemporary metropolis are also characterized as hyper-visible to the public and at the same time physically isolated from everyone else. The image shows the Lever House on Park Avenue in New York, built in 1952.

“Walls almost entirely of glass, framed with thin steel supports, allow the inside and the outside of a building to be dissolved to the least point of differentiation; this technology permits the achievement of what S.Giedion calls the ideal of the permeable wall, the ultimate in visibility. But these walls are also hermetic barriers. Lever House was the forerunner of a design concept in which the wall, though permeable also isolates the activities within the building from the life of the street. In this design concept, the aesthetics of visibility and social isolation merge.” (Sennett, 1992, p.13)

Simultaneously transparent and reserved, the New York skyscrapers became the direct metaphor to the modern city dwellers who confess everything, yearn for instant intimate relationships at the surface, and at the same time are detached and isolated from everything else (fig. 3.06.).

Sennett exhorts people to participate more fully and rationally in a life outside the boundaries of their own desires, rather than be concerned with their individual life-experience. However, the emergence of the internet and virtual reality only made the ability for disembodiment from the real world more available for a society that has become to consist of separated individuals.



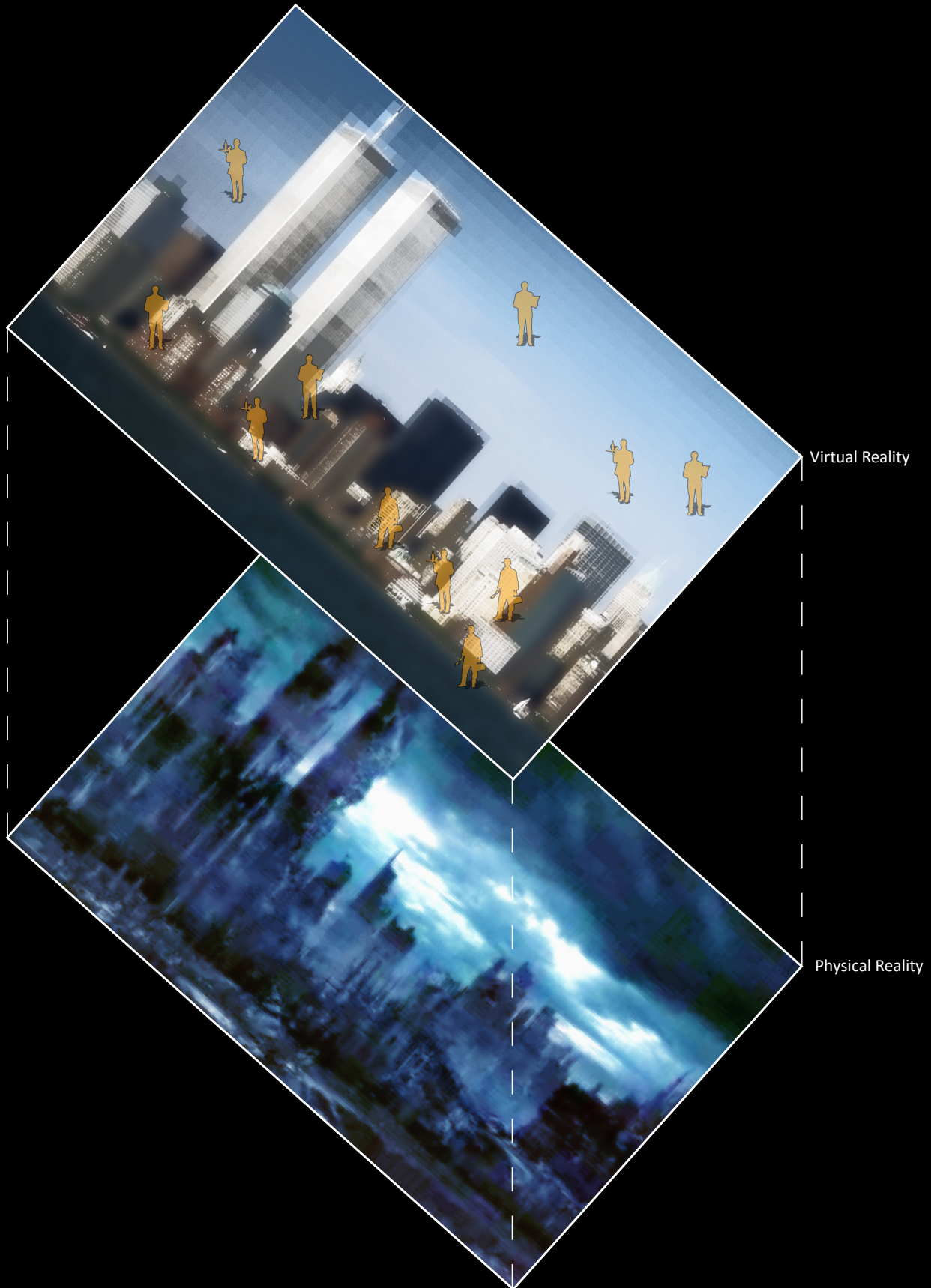


Figure 3.07

With the help of virtual reality, we are able to work, socialize, and interact with others in the simulated world. However, like the *Map of the Empire at 1 to 1 Scale*, one day we might not even realize that we have already abandoned our physical reality and left it in ruins. (image by author)

The Critique of the Virtual Space

Internet, digital network, and virtual reality offer various methods to transmit and to receive information, as well as to constantly update its content and environment through user/viewer's immediate feedbacks. Online virtual communities are becoming the next generation of the public sphere, where public opinions can be freely expressed and challenged anytime and anywhere. The nature of virtual simulation also allows the user to customize their digital space at will according to their desires. It has not only become the new testing ground for social interrelationship, but also the new playing field for empowered individuals.

Only in today's digitalized age can we properly speak of the experience of simultaneity of the world. This phenomenon, no doubt, weakens the experiences of both place and time, and uproots us from our ties with public space and even our intention to participate in the public: with the help of communication technology, less "I" need to interact with other people directly in order to obtain the things that "I" want. I can avoid having a conversation by shopping online, stalk someone without been spotted, or even becomes someone else by portraying my digital copy differently. I am safely separated from the other individuals, and at the same time, if I am curious, I can peak into other's digital space. Instead of going out and finding the things that I need, be it the need for exploration or navigation, or even friendship, love, or satisfaction, they can be displayed in front of me through the virtual network. I do not need to argue with other people or participate with the public because I can download anything that I want at ease in the virtual network.

However, in the virtual environment, all work is done in a virtual space: physical space becomes unnecessary and its vision is completely blocked

(Manovich, 2005). A person immersed inside the digital network is disconnected from the physical world and thus his perception of space and time is also temporarily shifted or detached. In the philosophical discourse, the very idea of virtual reality is a form of isolated space, simulated and cut off from the real world. The fable *On the Impossibility of Drawing a Map of the Empire on a Scale of 1 to 1* by Jorge Luis Borges illustrates metaphorically the danger of complete disembodiment and its impact to the physical reality (Borges, 1995).

The story involves theoretical paradox for an ambitious empire to produce a map that is exactly the same scale as the original territory (fig. 3.07.). The map would capture the totality of the empire – everything from the natural reliefs to its artifacts, as well as its inhabitants. In order for the Cartographers to draw the map as accurately and as faithfully as possible, the opaque map needs to be suspended over the kingdom directly on top of its reference points, so that it can be constantly updated and modified. But by establishing an opaque layer over the top of the empire, natural sunlight and precipitation are blocked, and thus alter the ecological equilibrium of the territory itself and cause deterioration overtime. When the map is finally completed, the inhabitants realized that they are now all living on top of the map with a 1 to 1 scale, and all subjects underneath the map are left for extinction. The empire is no more (Borges, 1995).

Like the map, virtual reality and the digital network is initially developed for the purpose of communication and navigation. However, both of them in the end have the tendencies to promote an isolated universe from the original world. The results are the subversive and dystopian. The virtual space which allows one to be fully immersed, like the chilling cybernetic world illustrated in the movie *Matrix* (1999), is what we are trying to avoid. The tools that we created should not replace its inventor. It is a scary and unrealistic path to follow. The question becomes, what is the next generation of communication technology that will resurrect the physical space? And if it is about bringing the physical back again, how will architecture morph with the emerging communication technology in order to promote public participation? How will we design new urban spaces that will further connect us not only as individuals, but as a collective group, a society?

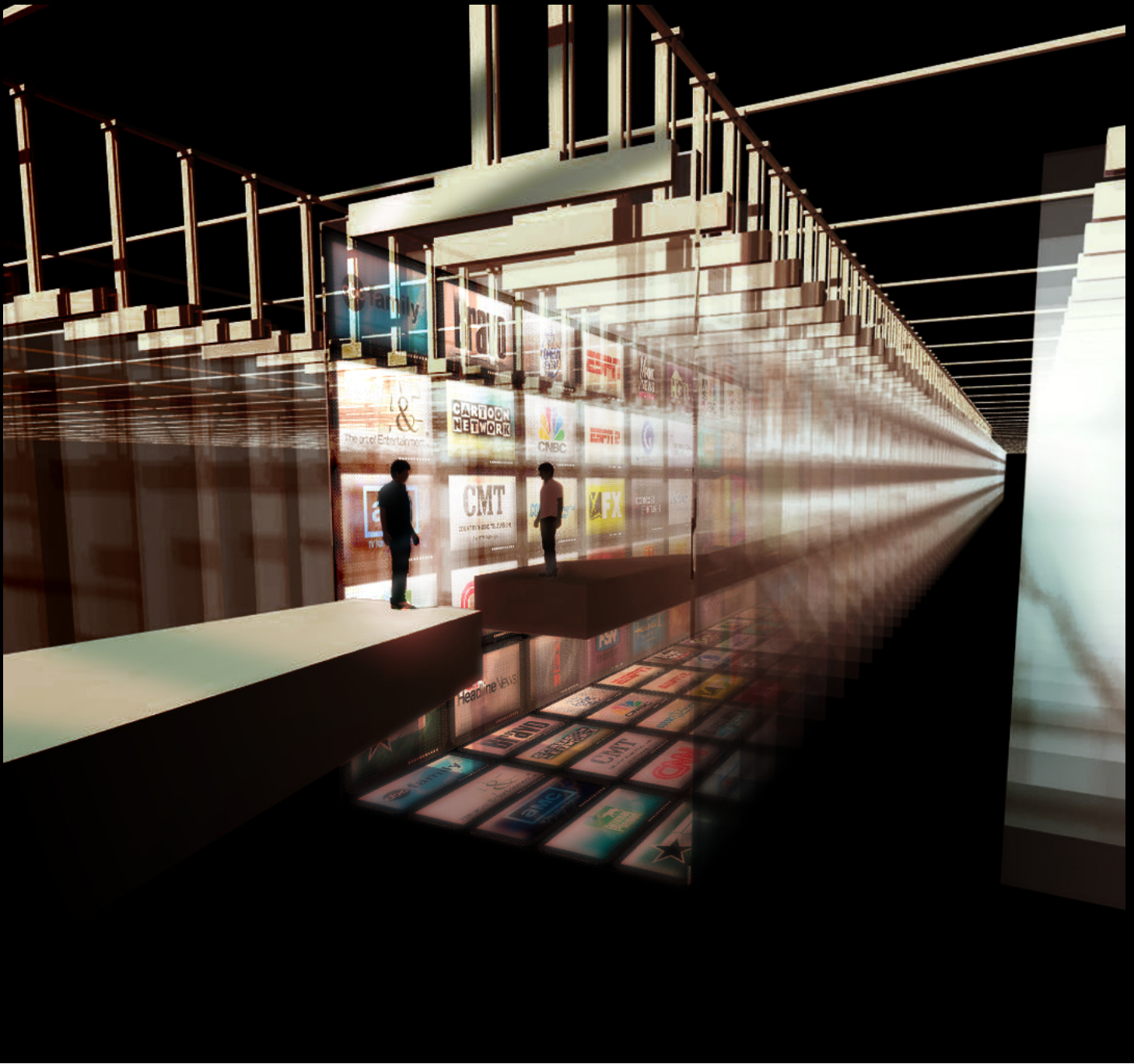


Figure 3.08

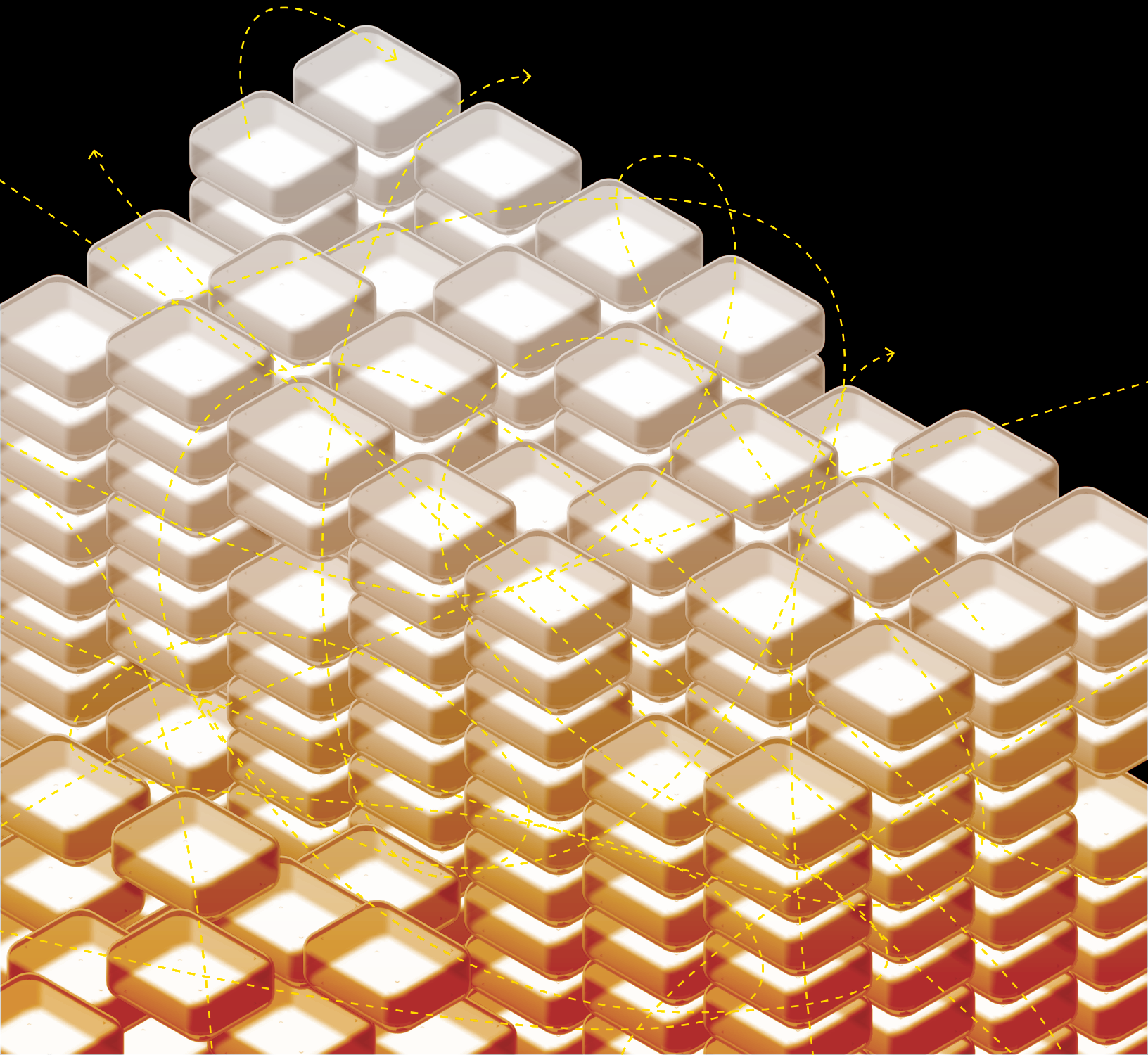
Simulated world could separate the user completely from the physical reality. One has total control of his environment and becomes god in his own virtual reality. When he is finally disconnected from everyone else, he is forever trapped in his own experience and desires, unable to tell what is real or simulated. (image by author)

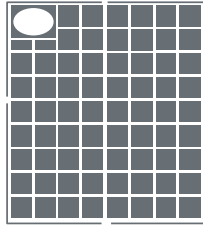
Figure 3.09

Axonometric diagram showing a part of the City with No Street, where all the public interactions are done through the digital network instead of the physical public space. It is an visionary approach where the concept of “connected isolation” between individuals are pushed to the extreme scenerio. (diagram by author)

Figure 3.10 (opposite page)

Comparing to the Roman Grid Plan and Haussmann’s Plan for Paris, the City With No Street contains no physical public space because all of the public interactions are done in the digital network. Individuals inhabit in the densely arranged “portals” where personal emotions, desires, and experiences are all projected inside. (diagram by author)

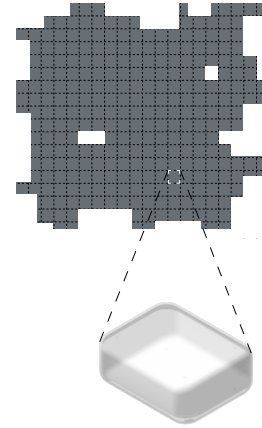




Roman Grid Plan, 5th century BC



Haussmann's Plan for Paris, 1870 AD



The City With No Street

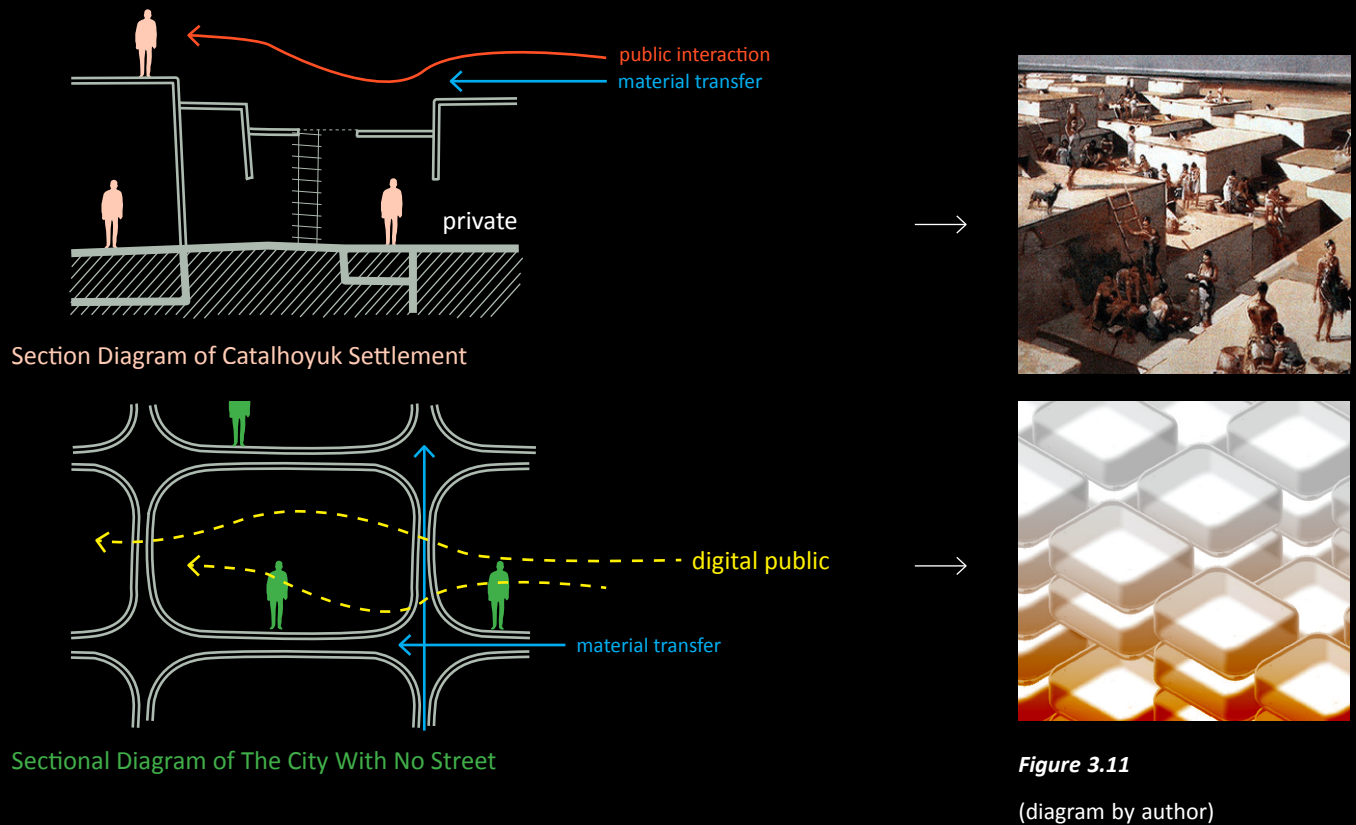
Design Intervention One:

The City With No Street

Other than functioning as a public thoroughfare, the main distinction between a street and a road is that a street facilitates public interaction – there is no road life but street life. However, if the street is made public but the people in it don't function as a public, that is to say, if all public interactions are being held in the realm of digital communication, then the purpose for a shared common space is defeated. A city with no public interaction in the physical spaces, and therefore, is a city with no street.

In response to the research based on the trajectory of the society, individuals, and information communication technology, the first design intervention is a dystopian vision to critique on the immaterialization of the physical selves and the subversion of physical public space. When all the information you need, including social network and different kinds of desires, can be satisfied through the network without having to leave the house, streets also become less necessary even as a thoroughfare. In this case, what is left for the street is for transporting material goods from individuals to individuals. However, even that can be replaced by an automated conveyer system much like the ones proposed for Plug-in City by Archigram (1964) (see appendix).

Looking back in history, though, there was another city with no street that existed approximately 9000 years ago. The Catalhoyuk was a large Neolithic



settlement located close to the present-day city Konya in Turkey. It was composed entirely of private buildings interconnected with one another. No footpaths or streets were used between individual households, which were grouped in a honeycomb-like maze (Hodder, 2005). In order to access each dwelling, one must travel across rooftops and descend through ceiling openings with a ladder (fig. 3.11.). Essentially, the roofscape became the common public space to host many daily activities.

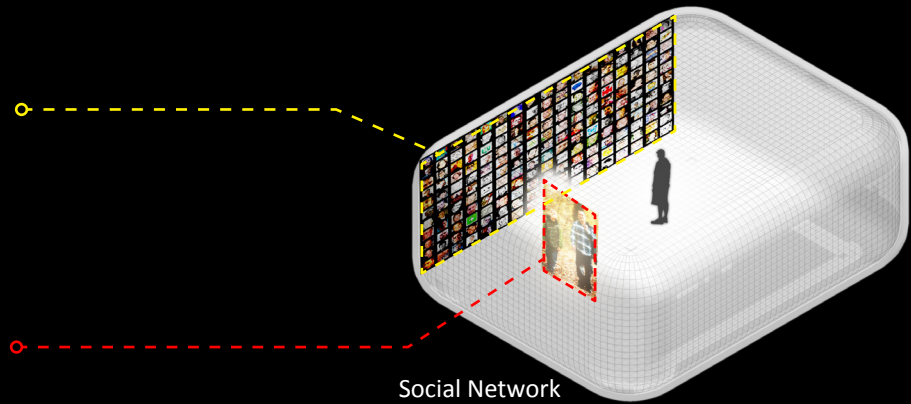
Using the settlement of the Catalhoyuk as an analogy, the first design intervention The City With No Street also hosts its public affairs elsewhere from the street. With the advanced communication technology, one could constantly shift back and forth from public to private function within a room. Since the pre-defined digital context or virtual environment can be downloaded and modified according to one's desire, there really is not much need for any interaction between the individuals to make the personal space better.

1. Environmental Screen

This new visual display screen incorporates nanotechnology to project ultra-high definition images and also change its textures base on the data it recieves

2. Interactive 3D Screen

A new generation of the holography technology which allow the images to be projected in the air and at the same time tangible to the user.



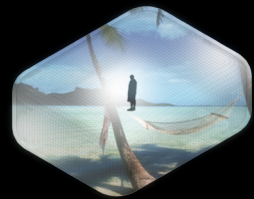
Shopping



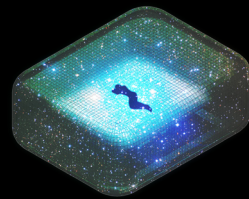
Park



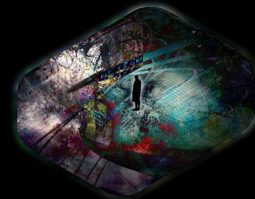
Work



Relax



Sleep



Malfunction

Figure 3.12

(diagram by author)

In the City With No Street, everyone are connected by electronic systems of communications rather than the street. However, this does not mean that the physical city dissolve altogether. On the contrary, it continues to grow as a huge physical apparatus. Inspired by Melvin Webber in his *Order in Diversity: Community without Propinquity*, inhabitants of the City With No Street get together in dense spatial organizations for non-spatial reasons – they live in the pod-like “portals” in order to communicate, but the act itself is not a spatial phenomenon (Wigley, 2002). Therefore, conversely, the denser the City With No Street becomes, the more subversive to its physical space within and also around the city.

In the virtual network, we are experiencing more personal freedom than ever before. However, in the physical reality, we are confined in the high-tech bubble-like pods which are densely packed along each other to fill whatever space is left available on earth...



Figure 3.12
(images by author)

GOOD MORNING
DOWNLOADING PUBLIC
IN PROGRESS.....

The Portal

FRIEND LIST #079

locating...



FAMILY

BLACKLIST #54

FRIEND LIST #231

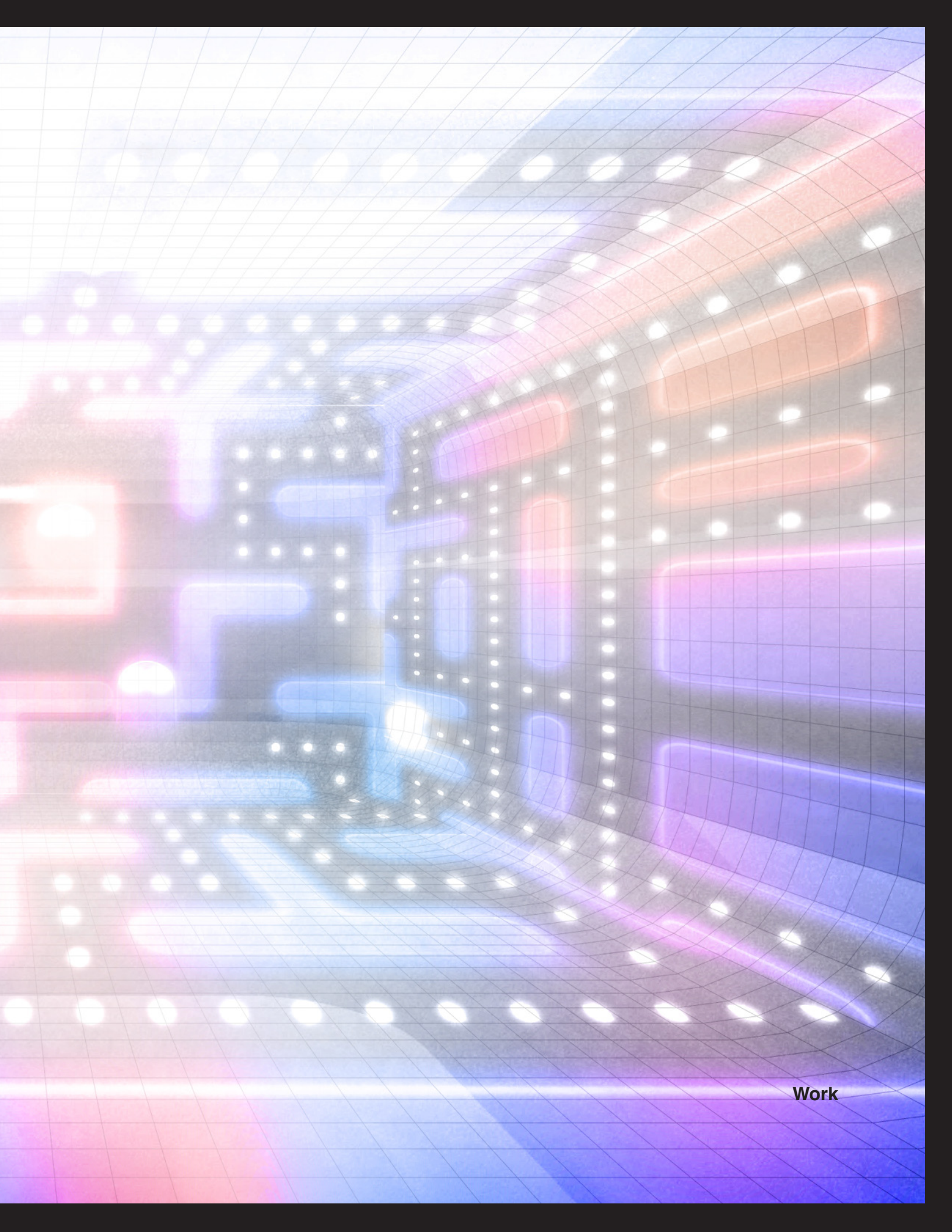
Social Network





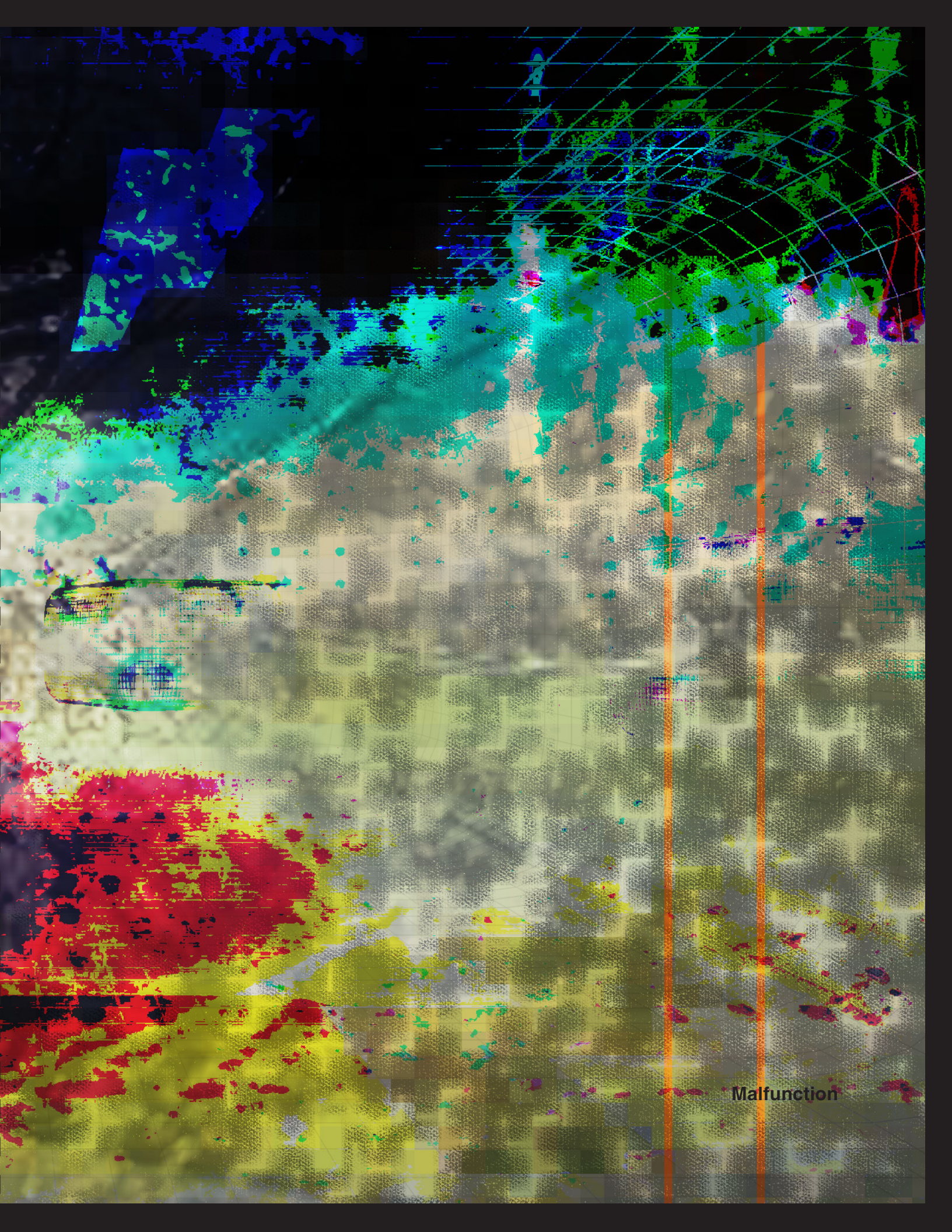
Public Park





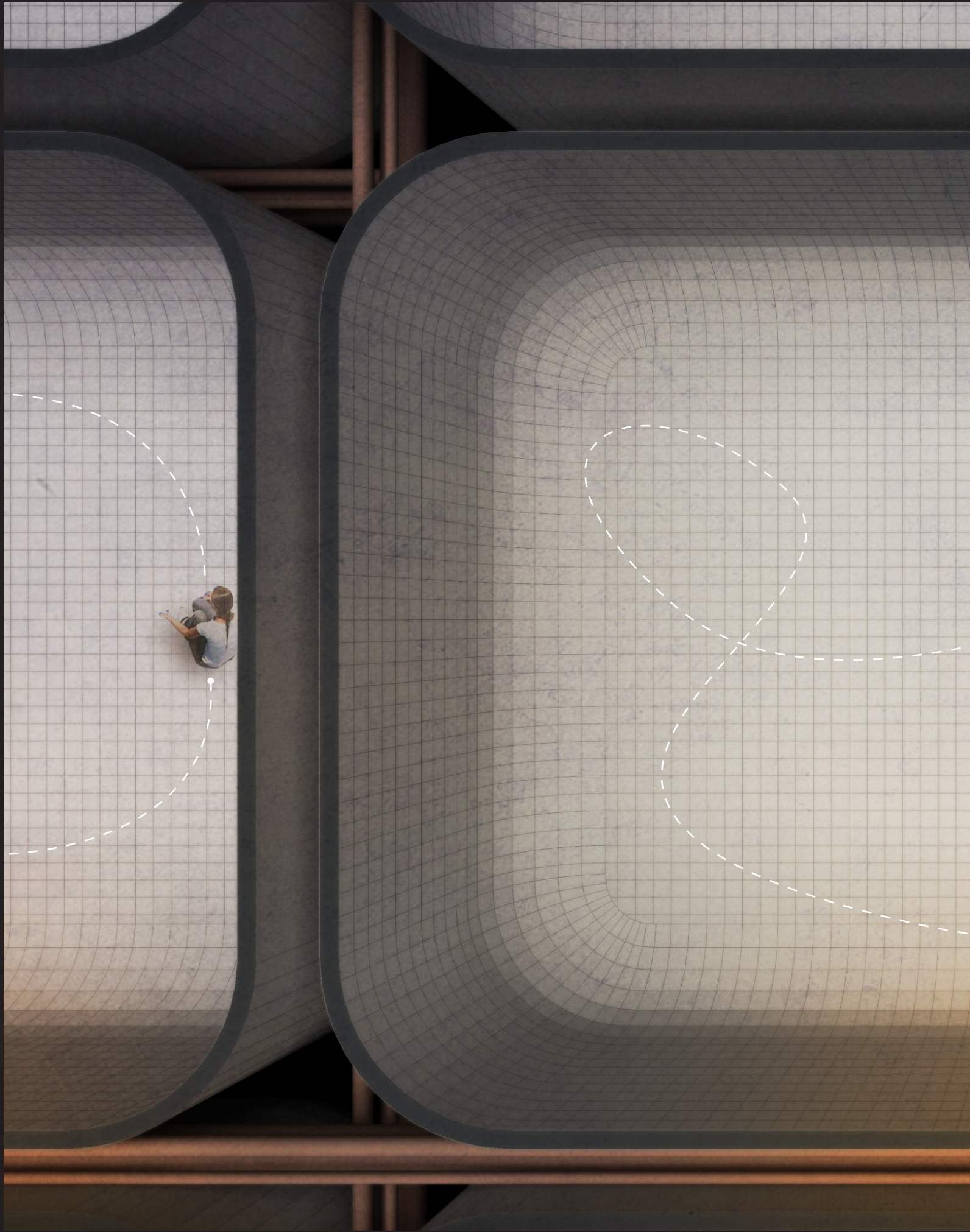
Work

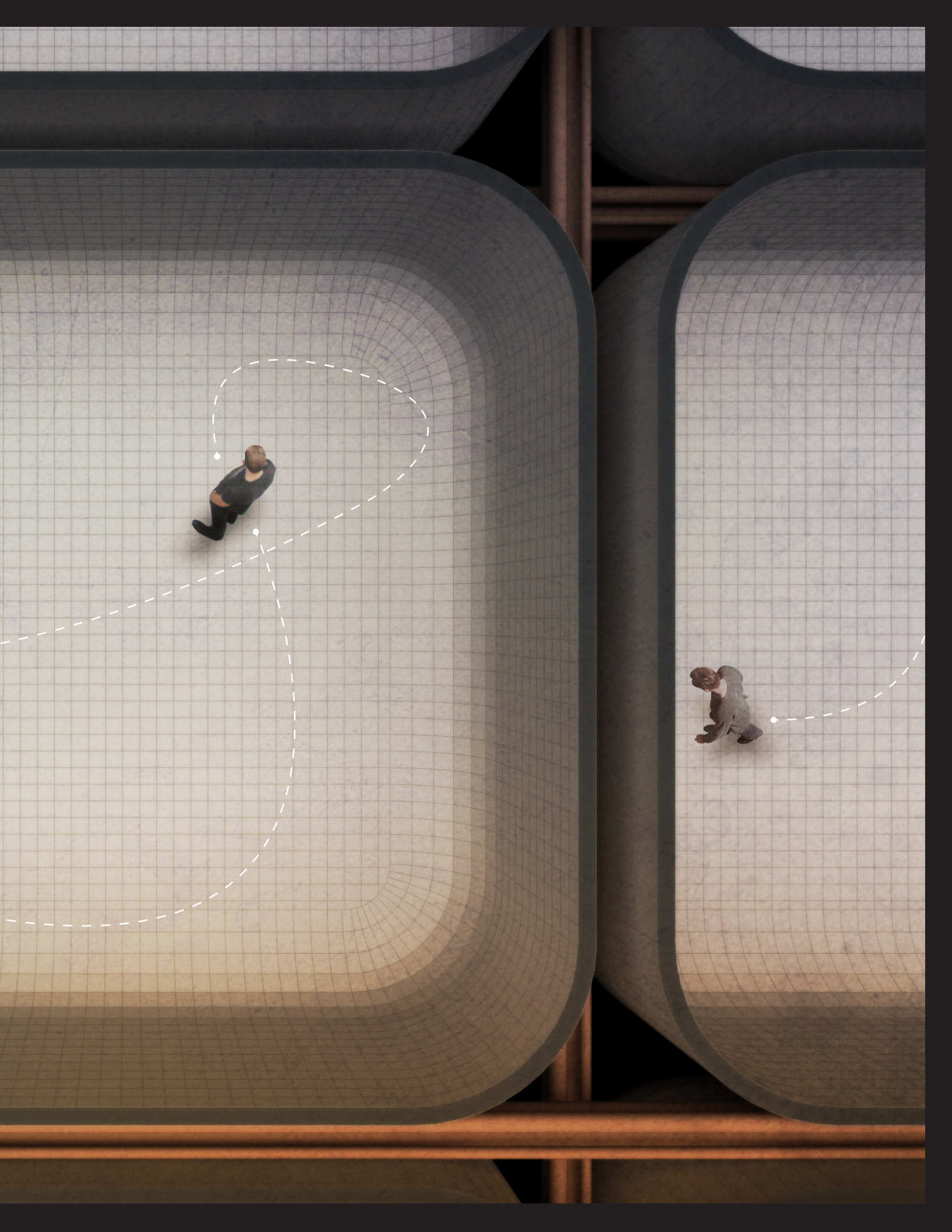


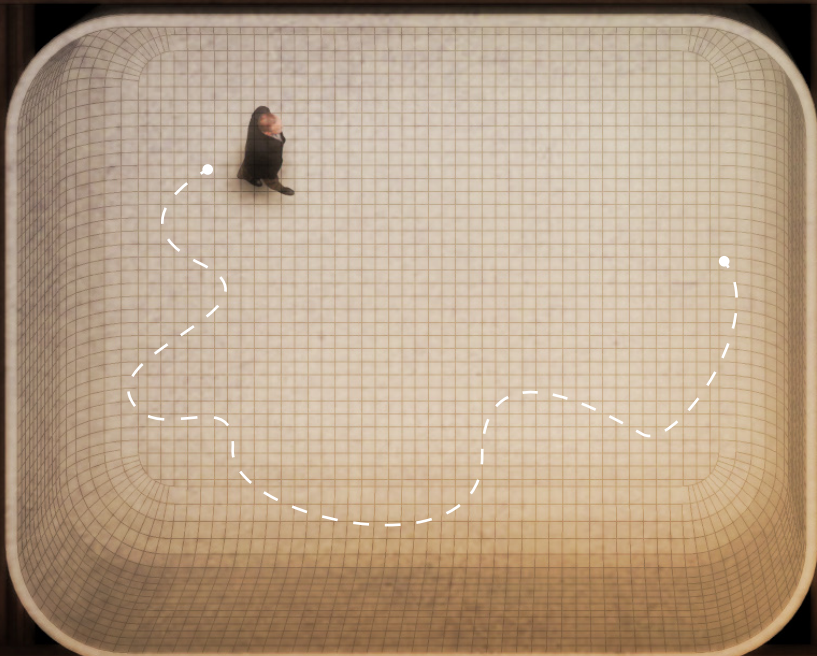
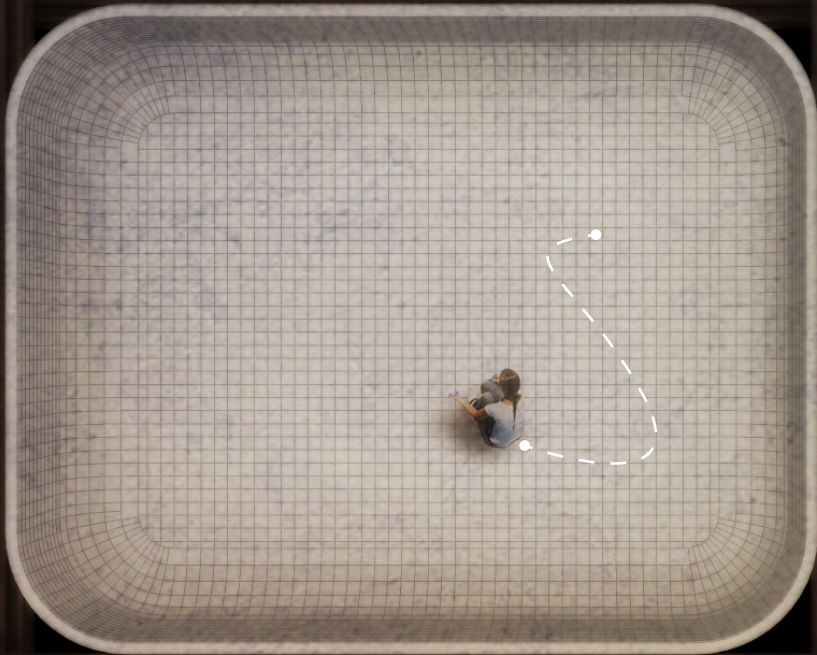
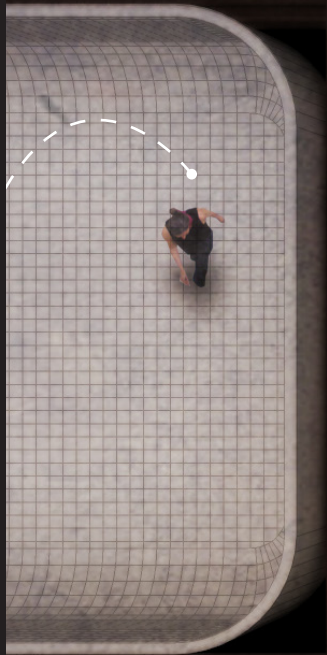
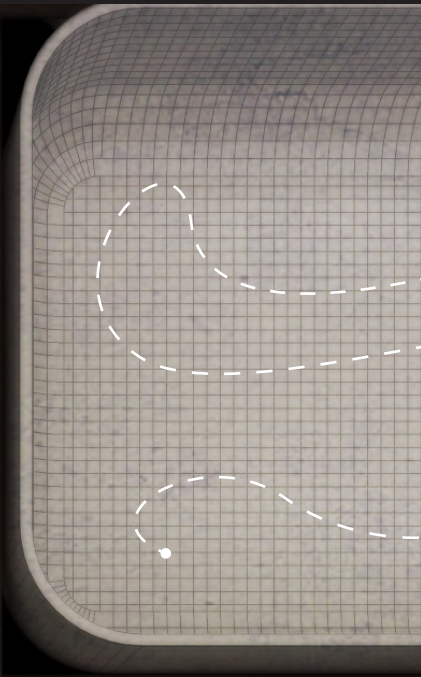
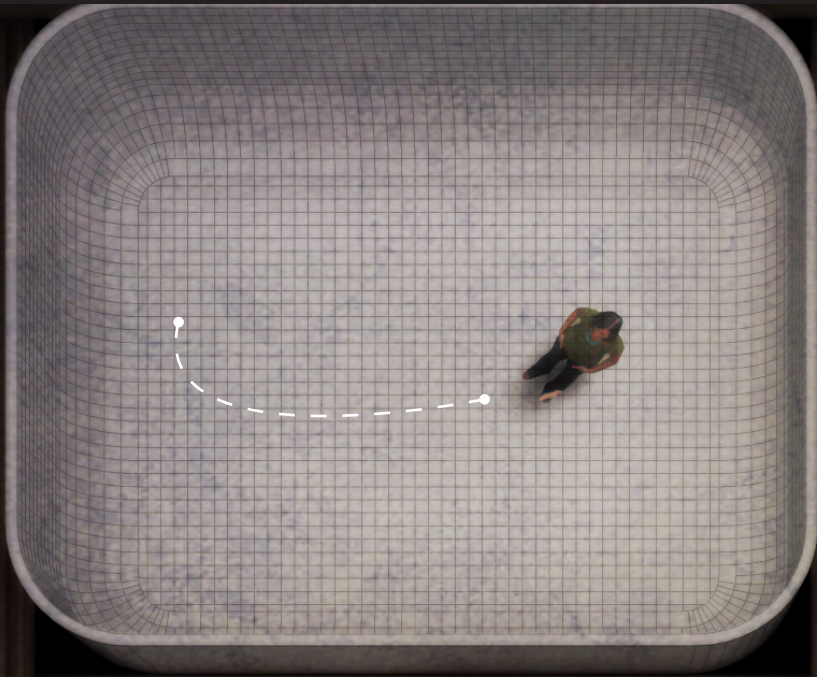
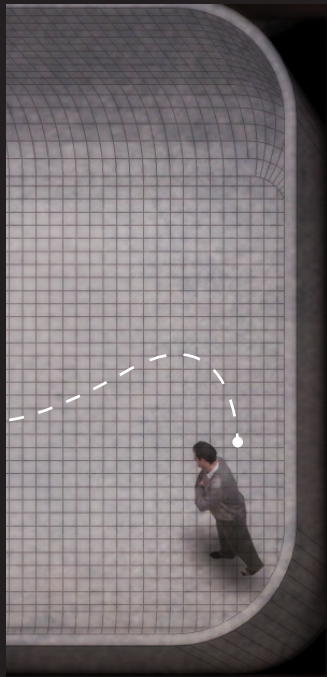


Malfunction

We shape the tools and the tools consume us...









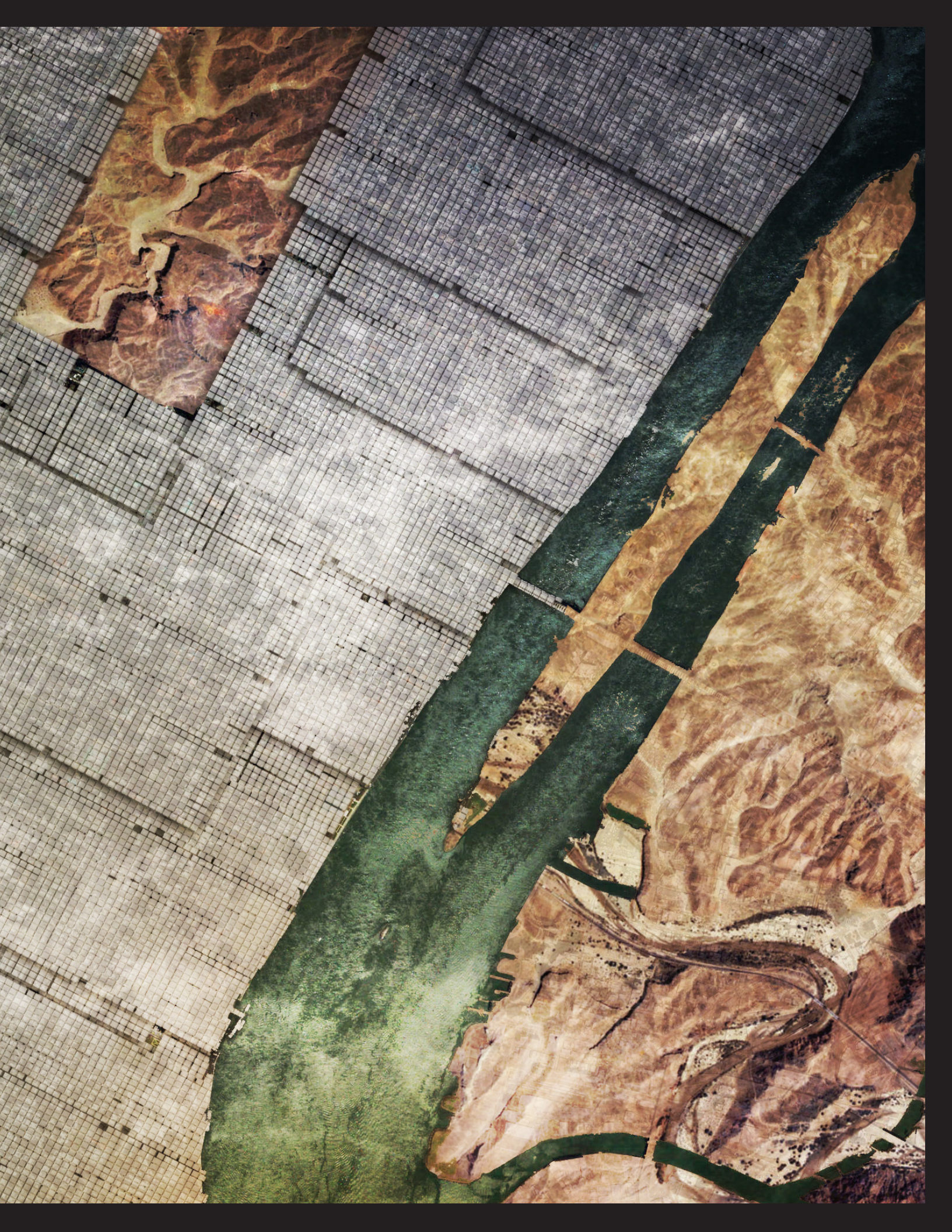






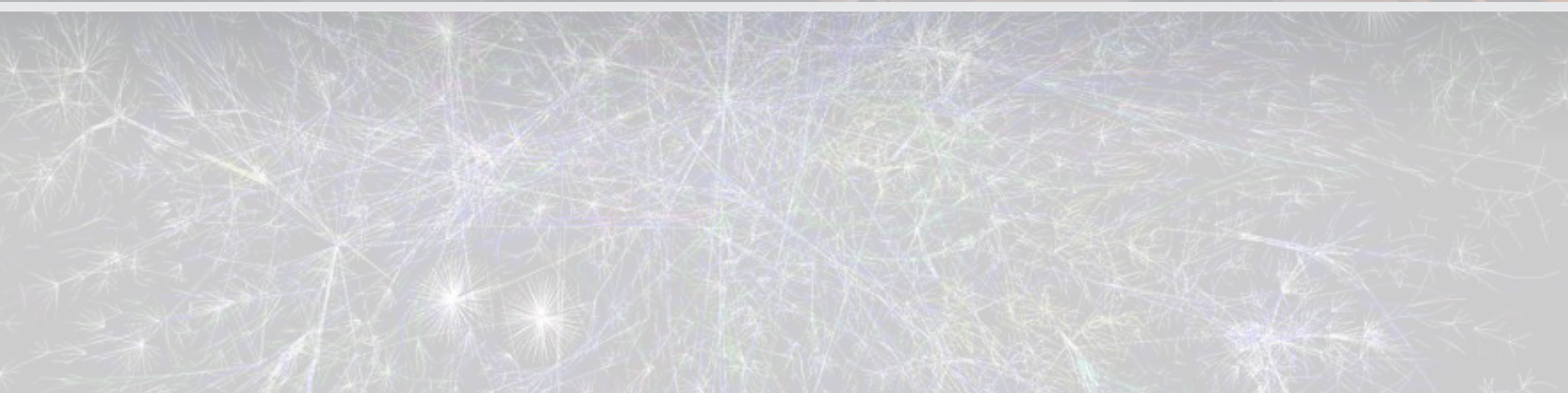






PART TWO

“The urban spaces of the modern city more often than not seem to project a sense of isolation, separateness and solitude. They do not promote experiences of belonging and togetherness; we remain as separate individuals in these spaces instead of becoming members of a collectively and historically rooted collective body.” (Avermaete, Havik, & Teerds, 2009, p.125)



Chapter 4

Architecture for the “New Digital Public”

Scope of Part Two

In Part One, the tendency to use information communication technology, namely internet and virtual reality, as catalyst of individualization might lead to a dystopian world where there is absolutely no more need for physical public space and street in the city. When all public interactions are conducted through the virtual network, there is no need for a common shared space for people to participate in. In addition to the simulated nature of the virtual reality, one would be further isolated from another because he no longer needs to rely on other people to make his surrounding better – in virtual reality, one can create his own dream world, changing and maximizing his desires at will.

The end of physical public space also spells death for architecture. Because of the massive benefit brought by the new communication systems, the city has lost its physical advantages and instead been replaced by an electronic development. In his published work, Melvin Webber notes: “.... inasmuch as cities are physical organizations that enable people to communicate with each another, new systems of communication allow for different organizations. Physical boundaries become irrelevant and cities become increasingly intricate and widespread networks” (Wigley, 2002, p.106). Developed from this phenomenon, the first design intervention, City with No Street, imagines a city which ultimately becomes a massive communication switchboard.

Figure 4.01

From one-way to multi-way communication model, ICT has evolved into a vast intricate digital network, allowing various forms of interactions. How might architecture address this growing phenomenon?

In Part Two, the research shifts toward the topic of how to avoid the demise of the physical public space by marrying new kinds of information communication technology with architecture in order to encourage public participation. However, as a communication vessel, conventional architecture mostly employs a one-way information exchange. From small scale events such as changing programs to large scale such as protest and festival, there is no direct feedback from the users and their behaviors in response to different social situations. Compared to communication technology, conventional architecture is more like a radio station broadcaster or a television producer, where architects inject their ideas into a building for the users to experience and to interpret, but with no feedback mechanism (fig. 4.01.).

In Part Two, I am investigating the possibilities for architecture to adapt and respond to social behaviors in real-time, and thus encourage spontaneous public interactions. Part Two would be treated as a process of exploration-, starting with three design exercises, each with different focuses and strategies. They are: diagram of Perception of Time and Space, Network city, and Interface city. The three individual exercises do not necessarily try to tackle part two's objective. However, they all are relevant to the topic of architecture and information communication technology, and therefore important work-in-progress to reach the final design concept. Finally, the research and design explorations would lead me to the second design intervention – the New Tahrir Square. The design aims to spatialize the so-called online revolution in Egypt, and develop a new type of public space which responds to public interaction through both the digital and the physical social engagement. Instead of a one-way information exchange, the New Tahrir Square aspires to optimize the “new public”, which from the previous research, is deeply dependent on the ICT and the digital network, by strengthening physical public interactions through architectural design.

Architecture as Interactive Communication Vessel

In a way architecture is one of the oldest forms of communication tool ever developed. We design buildings not only to provide protective, useful, or aesthetically pleasing spaces, but also as a vehicle to carry messages or ideas to the individual users or the public. In this aspect, the space should be designed to encourage human interaction, connectivity, and public engagement.

Like any forms of communication apparatus, architecture should also be pushed into the realm of communication rather than grounding it in its original “solid state” (Kerckhove, 2001). However, when marrying architecture to the digital network, we always end up with the paradox of being both fluid and solid. Relating the immaterial digital network to the material environment has always being a difficult and complex task and therefore the two often exists in the parallel world. However, some recent experimental projects are more expressive and responsive to its environment. Examples can be found in Peter Cook’s Kunsthaus Graz, UNStudio’s Galleria Seoul, and Diller+Scofidio’s Blur Pavilion. Internal and external physical manifestations of architecture are incorporated with dynamic, abstract, and sometimes transparent layers of digital information, making the “inside” and the “outside” even less defined and more interactive. As a result, the spatial conditions and the ephemeral facades of the new architecture are ambiguous, overlapping, and constantly changing.

As we can see from those projects, some have already started to respond to environmental factors such as temperature, humidity, and wind. However, architecture that adapts and responds to social behavior, or encourages public interaction by changing its form and visual perception has not yet been realized, except in the conceptual form of visionary architecture such as Fun Palace and New Babylon developed in the 1960’s, where the architectural organization is constantly morphing and changing according to people’s experiences and desires (see appendix).

Design Exercise One - The Perception of Time & Space

As Steven Holl (2009) stated in his book, “time, as experienced duration, is relative to an individual and to a space” (p.248). The “space” that we inhabited in, be it physical or digital, influence how we perceive time, and therefore, must be equally treated not only in the field of software programming – i.e. how digital network affects the physical surroundings, but also in the field of architecture – i.e. how physical behaviours influence the cybernetic world.

To be able to visualise the experience through a continuity or gradient of digital information flow, the first design exercise aims to map out our perception of time and space in both physical and virtual realms. The graph is drawn on two axes – the x-axis shows the time in hours throughout a day, and the y-axis represents our perception of space. Time is differentiated in two parallel lines: X1 represents how we experience time, and X2 stand for the universal time. On the other hand, the perception of space is divided into two categories: the positive y-axis being our experience through

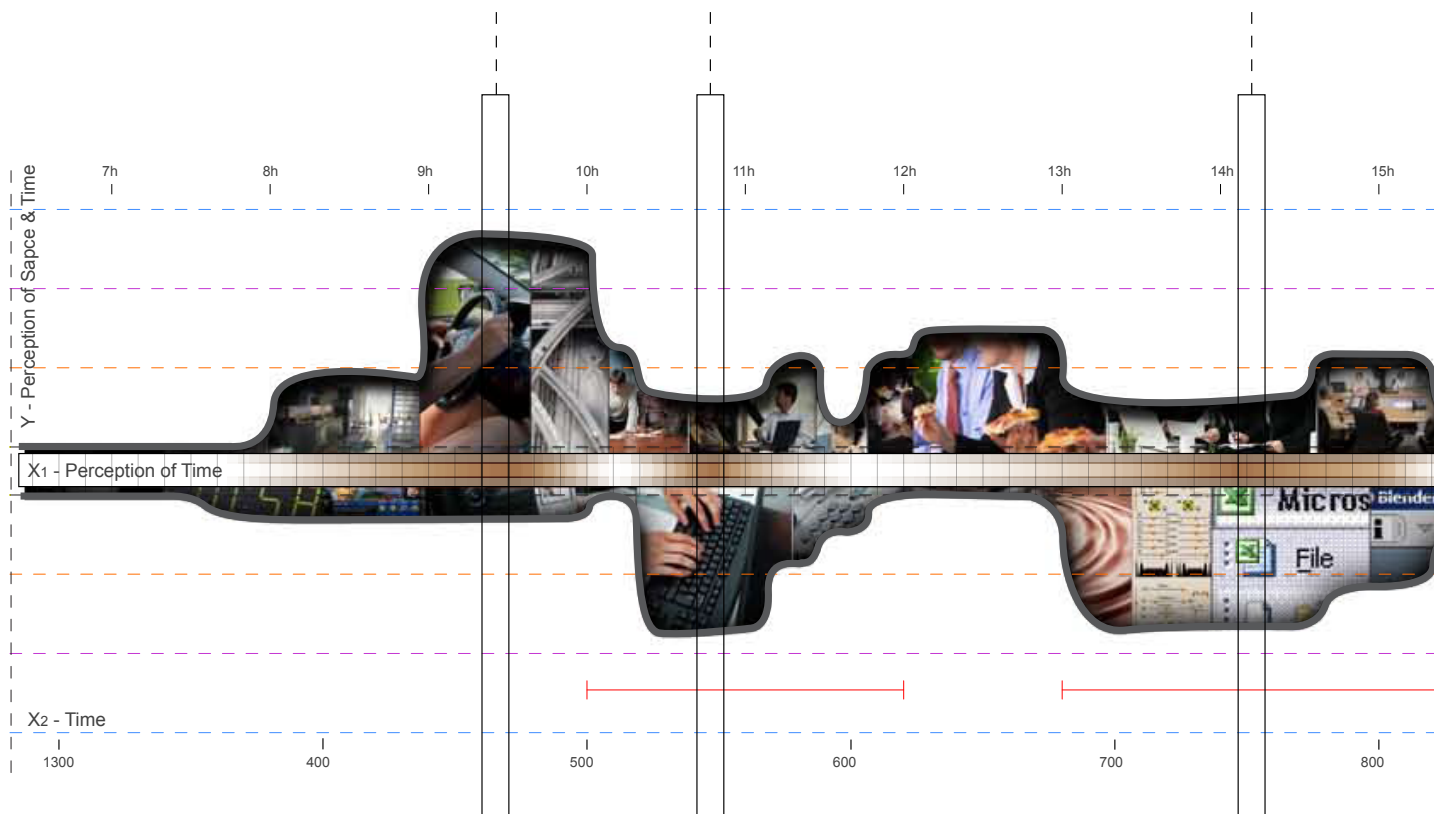
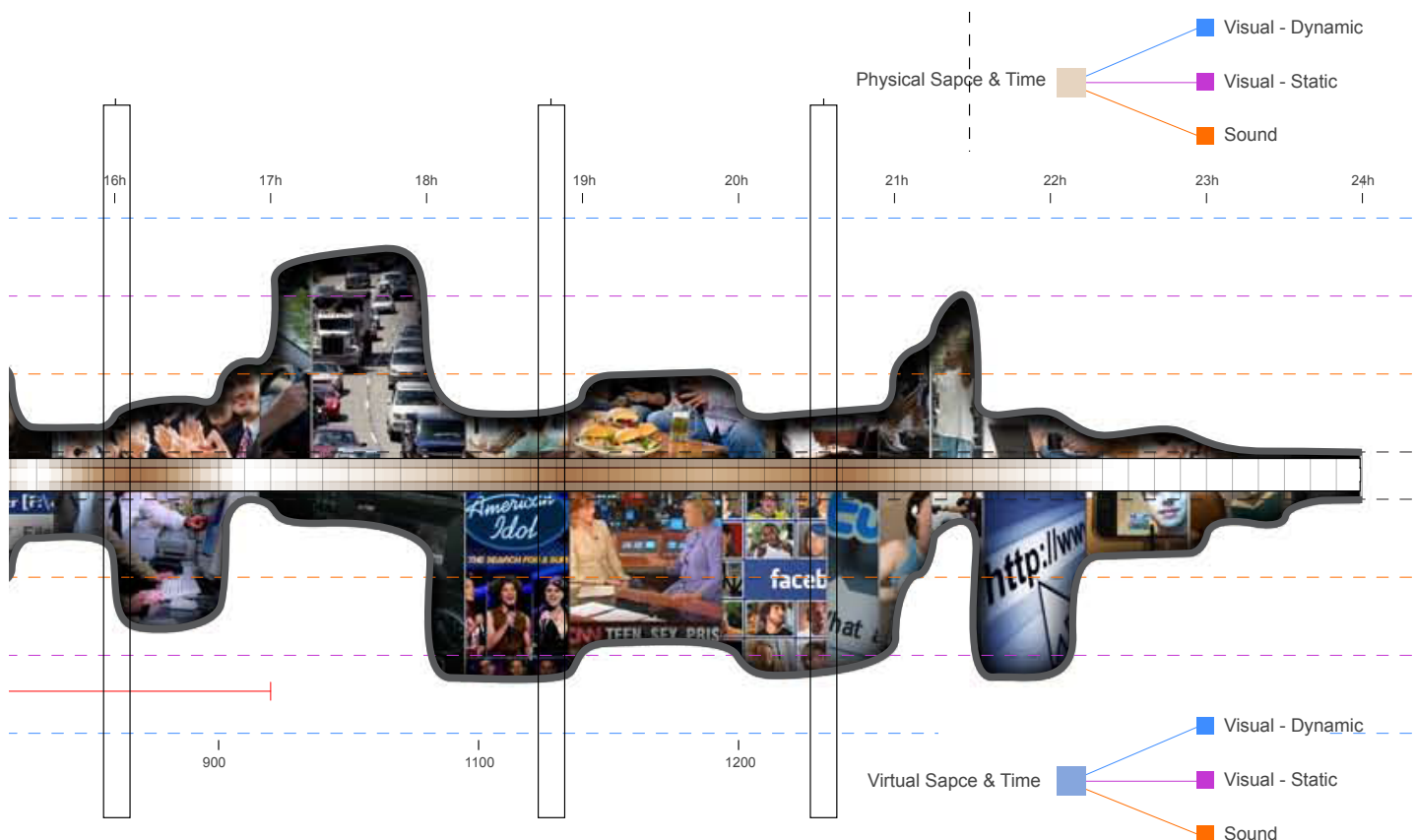


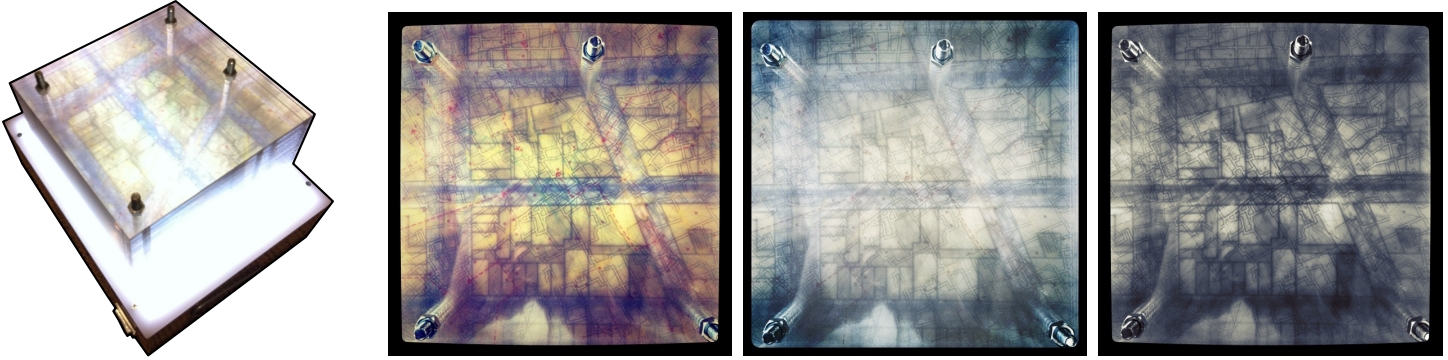
Figure 4.02

Perception of Time
& Space

physical space, and the negative y-axis being our experience through the digital space.

When we carry out our daily activities, we encounter numerous occasions that suggest participations in both physical and digital realms. Our focuses depend on the level of stimulation that is presented in front and around of us. When I am working on my computer, I rarely notice the sounds or the minor movements that are happening around me. On the contrary, when I am driving, if I pick up my mobile phone and talk to someone else through the network, I can barely notice any sudden road condition and make an emergency manoeuvre. When both digital and physical perceptions of space add up, one perceives time faster (highlighted X1). However, there can only be so much that one can perceive and observe. And therefore, if we are to design something that allows us to travel between the two realms, we must take the transition into consideration: when an individual or a group of people is immersed in the digital network, what can we do about their physical surroundings?





Design Exercise Two - The Network City

The second design exercise takes Manhattan as the testing ground. Already, Manhattan is one of the most advanced city in terms of the communication technologies and its various network distributions. Because of its existing grid system which allows one to build freely within the bounded quarter regardless of what the neighbour does, it is also tempting to look at alternatives such as aperiodic organization system that allow people to explore and drift. This design concept investigates the extent of the network city and imagines an extreme scenario where the new physical built fabric of Manhattan becomes a disorganized three-dimensional labyrinth. The trick to make this chaotic city habitable is through the use of communication technologies.

Inspired from the previous research, the new public sphere has become an intricate digital network that covers the whole city – from navigation to access all kinds of information, the cloud network is the most important infrastructure that governs and manages everything within. Because of the invisible infrastructure, the inhabitants of the Network City are never lost or disoriented. The experience of the city is maximized based on personal preference. In another words, everyone in the city becomes what Situationist described as “the derive” (Sadler, 1999). In here, people are traveling all the time. They are like nomads and constantly changing their surroundings. Connectivity of the Cloud Network links the fragments in space which is constantly changing its configuration. The tactic of Psychogeography is now the wireless connectivity which brings the city dwellers with a new awareness of the urban landscape.

The Network City allows me to acknowledge the importance of the existing infrastructure floating in the air. It is a more direct architectural impact developed from the previous theoretical research on the new form of the public.

Figure 4.03

Physical Model of the Network City. Material: printed transparent sheets with layers of plexiglass, sitting on a light box to project 3D effect of various networks.

Figure 4.04

Rendering of the Data Centres

Data Centres

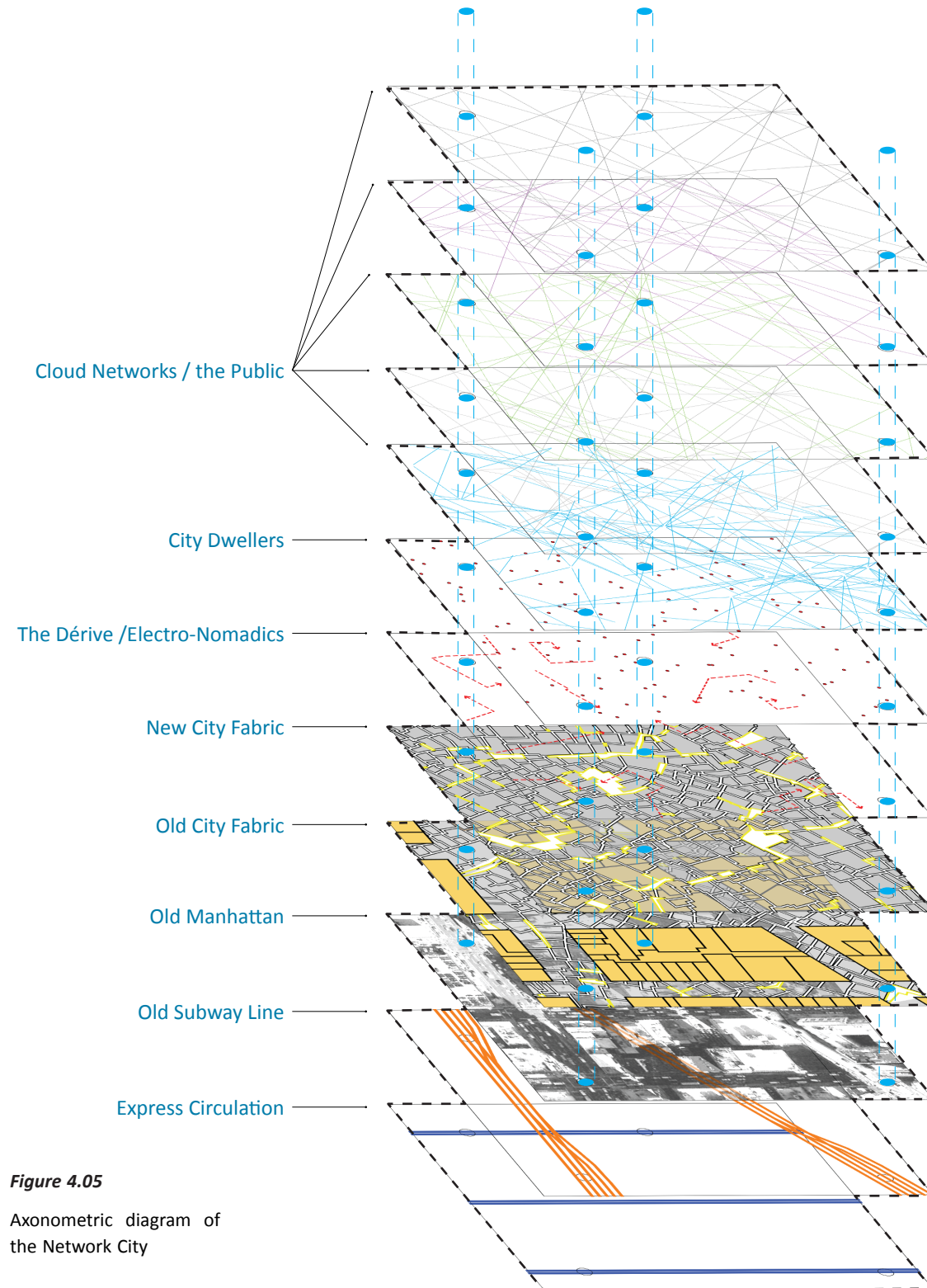


Figure 4.05

Axonometric diagram of the Network City

Design Exercise Three - The Interface City

Developed further from the Network City, the Interface City takes St. James Town in Toronto as the site and aims to transform it from an existing urban island to a place where ambient connectivity is the fundamental principle. The concept is to learn from the electrical infrastructure and develop a strategy to adopt open and dynamic information exchange anywhere within the complex without the need of personal electrical handheld devices. Spaces are built not only according to the structural framework of the complex, but also to the proximity of the digital interface medium (fig. 4.07). It is where all kinds of information are monitored, processed, displayed, and shared among everyone who lives in the Interface City.

The abstract approach of this design exercise teases out the limitation of architecture and the paradox of being both material and immaterial at the same time. Since architecture is a material manifestation and since that which does not have material existence is virtual, architecture faces difficult contradiction. The idea remains to make use of a material or a set of physical system that can somehow move us.

Figure 4.06

Rendering of the Interface City



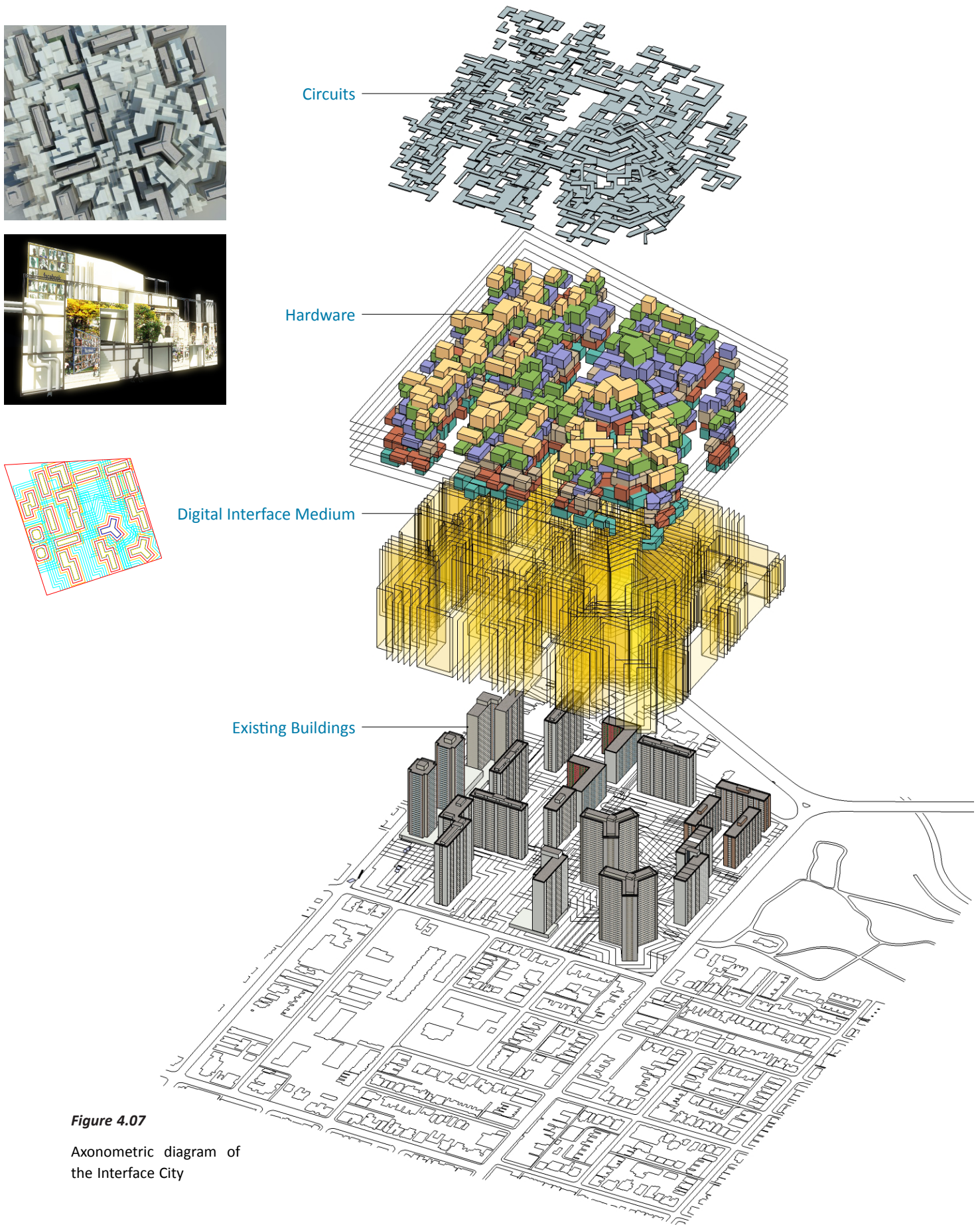


Figure 4.07
 Axonometric diagram of
 the Interface City



Figure 4.08

A scene at Tahrir Square,
Cairo, in January 2011





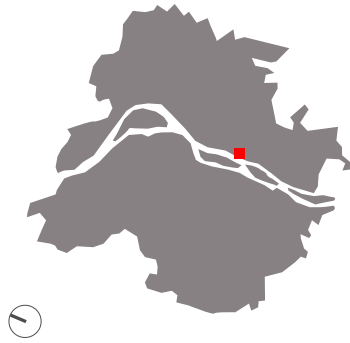


Figure 4.10

Map of Cairo, Egypt. The red square indicates where the design site is located.



Figure 4.11

The Tahrir Square is where many political demonstrations occurred throughout history of Cairo.

Design Intervention Two:

The New Tahrir Square

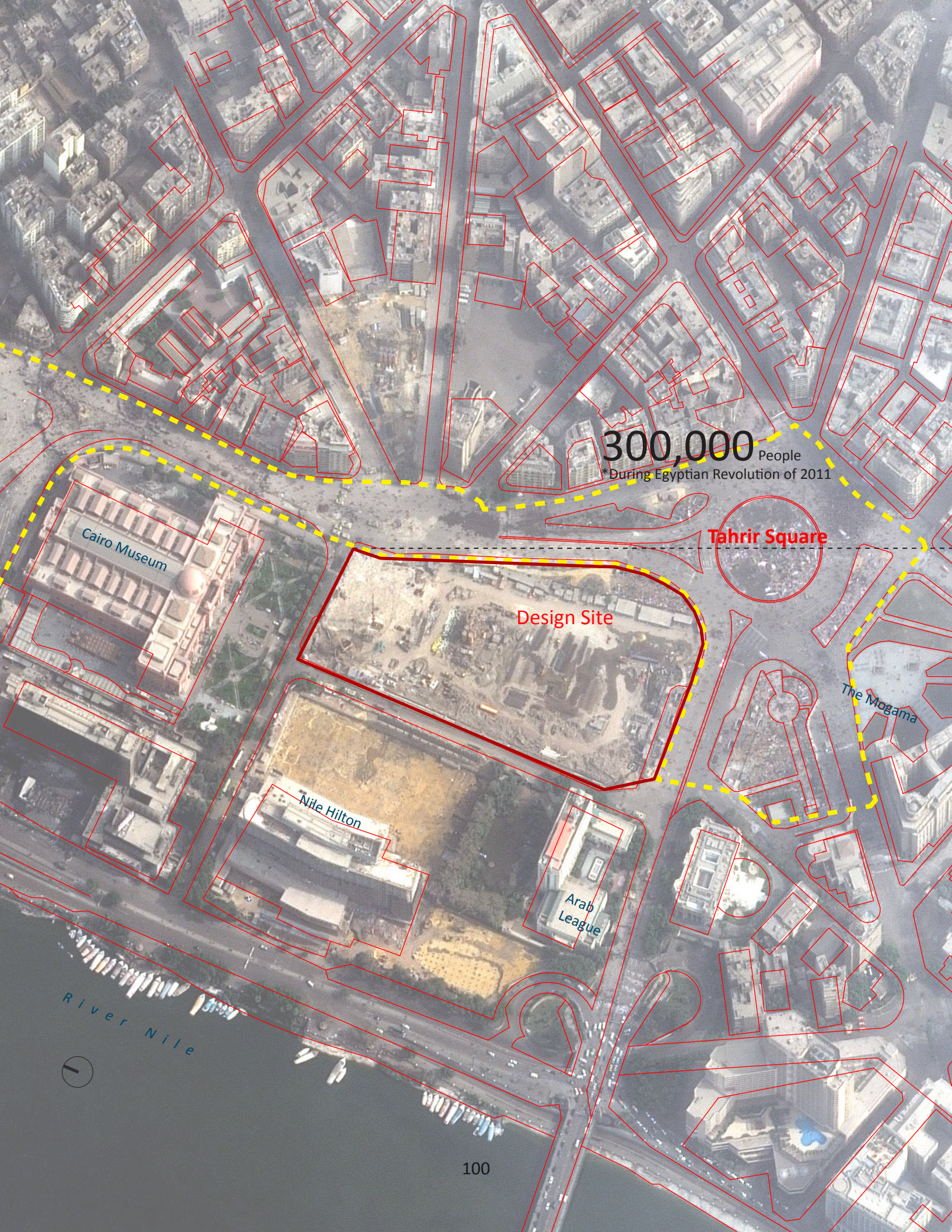
Began with the Egyptian revolution in 2011, we have realized the importance of the ICT and also the reason behind our need to be connected through them. As the society evolves the shape of the public changes as well, and we can no longer treat the public mass the same way as before. The public today is deeply dependent on the digital network, and by taking the network away could send panic amongst people (as happened in the Egyptian revolution). To confront the new public, we must acknowledge the new social behaviour, and realize that the digital public space is just as important as, perhaps sometimes even succeeding, the physical public space as a place to interact and to share public opinions.

However, as we can see in the first design intervention, the City with No Street, relying too much on the ICT and the digital network might result in further individualization and fragmentation. Consequently, it also spells death for public architecture as there is no more need for a shared physical space. For the second design intervention, the New Tahrir Square, the project aims to find a design strategy that balance the presence of both the digital and physical public space, and thus create a hybrid space in which both digital network and local crowds supplement each other to augment the public experience.

Tahrir Square in Cairo is chosen as the design site for two reasons, one symbolic and one contextual. Symbolically Tahrir Square has always been

Figure 4.09

Site aerial photo



300,000 People
*During Egyptian Revolution of 2011

Tahrir Square

Design Site

The Mogama

Cairo Museum

Nile Hilton

Arab League

River Nile

Figure 4.12

Tahrir Square site plan and its scale in comparison with other public squares

a place for public engagement. It not only was the focal point of the political demonstration in 2011, but it also represents the very foundation of the Egyptian public. After the Egyptian Revolution against the British occupation in 1919, the square was known as the “Liberation” (Tahrir) Square, and was formally renamed as such after the Egyptian Revolution against the constitutional monarchy in 1952.

Contextually, Tahrir Square holds an important geographical location. At the centre of the Tahrir Square is a large and busy traffic circle. The square is surrounded by important city buildings including the Omar Makram Mosque, the famous Egyptian Museum, and Mogamma government building, the headquarters of the Arab League, and also the Nile Hotel. Situated at the heart of Cairo, the Square is recorded to host up to 300,000 people in the square and the adjacent streets.

0 m 100 m 200 m

Dundas Square, Toronto

12,000 People

Schouwburgplein, Rotterdam

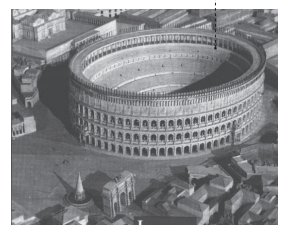
12,000 People

Jay Pritzker Pavilion, Chicago

11,000 People

Colosseum, Rome

50,000 People





Space needed to
stand shoulder-to-
shoulder

10,000 people

1,000,000 people

Active Facebook
users in Egypt

7.3 million people

750 million people

Active Facebook users in the World

The Capacity of the Physical and Digital Public Space

I am interested in creating a public space where not only political demonstrations will take place, but also all kinds of public expression, such as festival, temporary market, music concert, and cultural exchange. More importantly, the public experience like the Egyptian revolution will be mediated and enhanced by the presence of ICT and the digital network.

We already know the potential of the existing Tahrir Square, but to understand the potential of the Egyptian digital public space better, the diagram above illustrates the capacity of the audiences/actors in a digital social network (fig. 4.13.) Facebook is used only as an example here. It does not represent all other social networks or digital public spaces.

Figure 4.13

The red squares show the amount of space required if 10,000 or one million people stand shoulder to shoulder in a public space. Below in blue is the visualization of the Facebook users in Egypt. To overlay the public space with the network is equivalent of introducing additional 7.3 million more people into the space. Let along the digital public is not merely just local, but global.

Figure 4.14

The relationship diagram of the “islands”

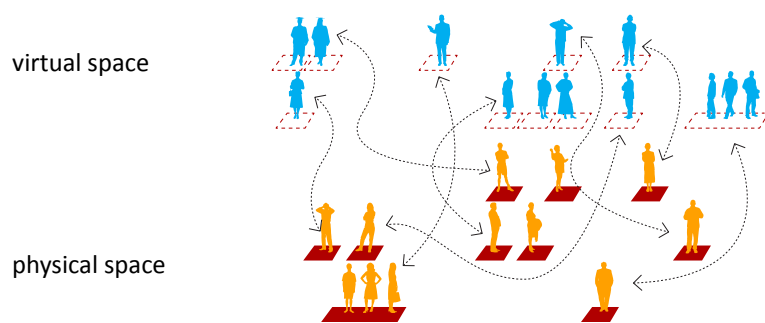
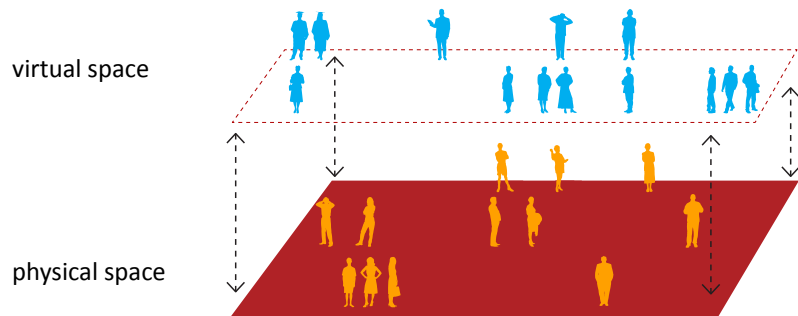


Figure 4.15

Parti Diagram

The relationship diagram of the “common ground”



Design Concept

The current model (fig. 4.14.) represents the individual connections between people in the contemporary society. I describe it as the “islands”. As convenient as it is, however, this model leads to a disconnected relationship in the physical realm, which leads to the natural trajectory of what sociologist Peter Sloterdijk describes as “connected isolation” (Sloterdijk, 2008). This model also traces back to the first design intervention the City with No Street

For this design proposal I want to achieve using the model of the “common ground” (fig. 4.15.). The design concept is to provide a common public space, both virtual and physical, and to allow real-time feedback and interaction by mediating the experience of the “public” and enhance social engagements in both realms.



Figure 4.16
Site Plan



0 m

100 m

200 m

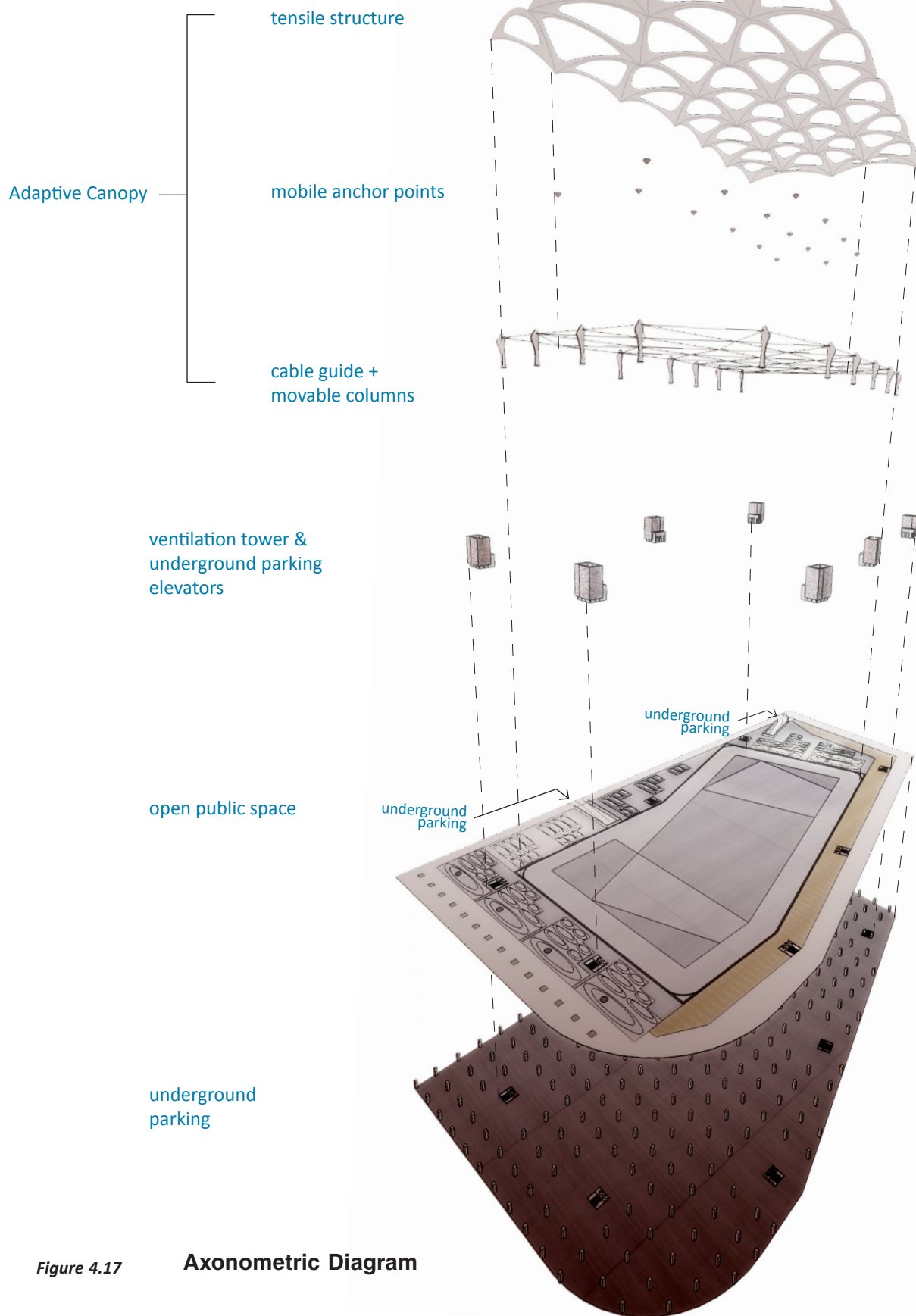


Figure 4.17

Axonometric Diagram



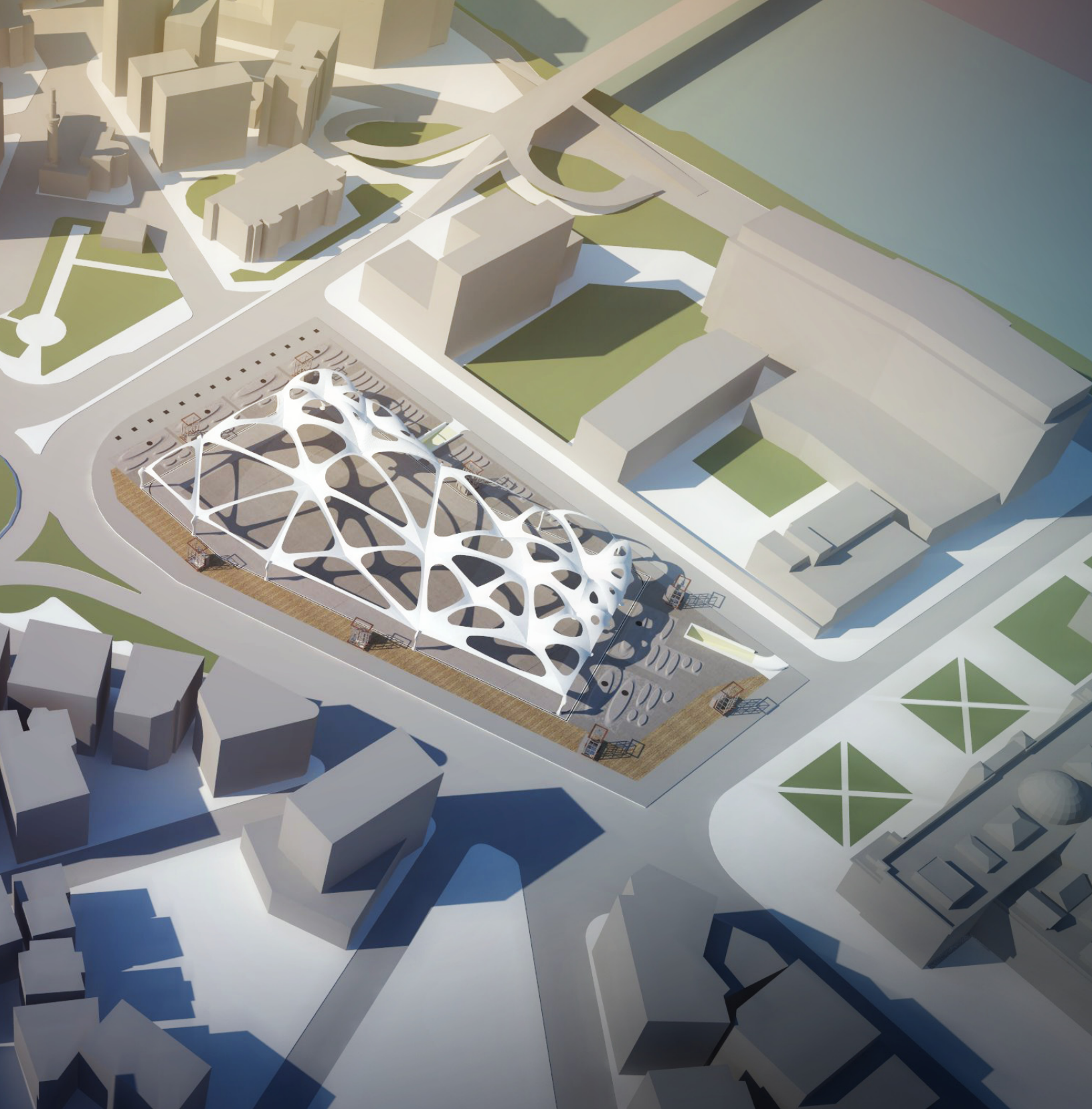


Figure 4.18
Aerial Perspective

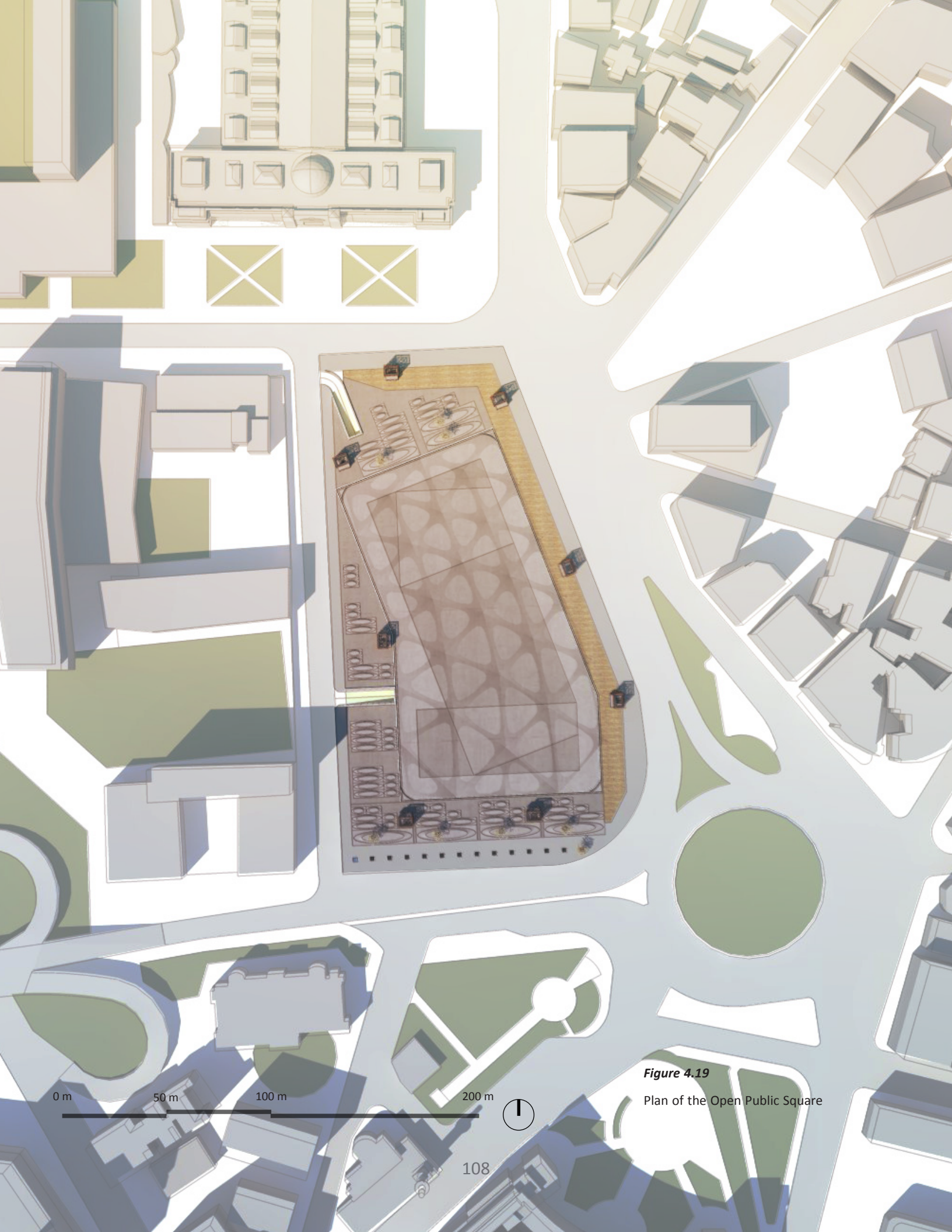


Figure 4.19

Plan of the Open Public Square



Figure 4.20

Ventilation/Parking Access
Towers

Like the parti diagram (fig.4.15.), the New Tahrir Square consists of two major components – the open public square which is adjacent to the existing traffic circle, and the adaptive canopy (fig. 4.17.). Underneath the canopy is a big open space which unlike a traditional square, focuses not on generating greenery, but on creating a place for the city dwellers to colonize on their terms. The space is purposely left open and under defined because pre-programmed space is one-dimensional. Instead of defining pathways and program spaces, the new open public space should evoke creativity. Underneath the open public square is a proposed underground parking. According to a local habitant, due to the heavy usage of the surrounding buildings such as the museum or the government building, it is very difficult to find a place to park. Ventilation towers and parking elevators/stairs are located at the perimeters of the site, marking the boundary between the square and the heavy traffic (fig. 4.20.).

On the other hand, at the north, south, and west side of the site, dune-like benches are proposed to provide a meeting and resting area (fig. 4.21.). Although the benches are not situated underneath the adaptive canopy, it should also provoke imagination for the locals to use the space – seating, stage, or meeting table.

Figure 4.21

Dune-like urban square seatings

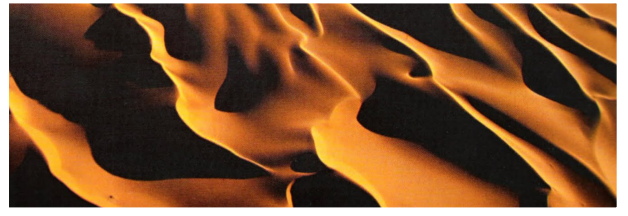
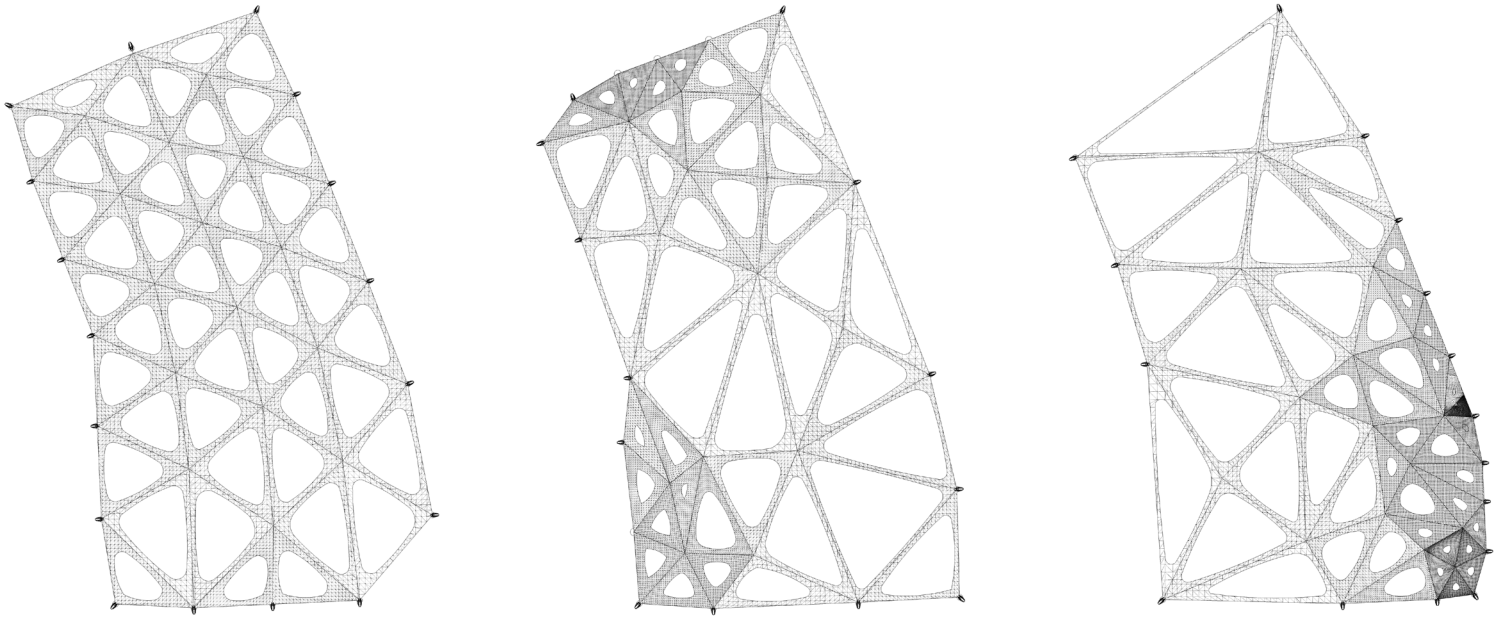






Figure 4.22
Ground Perspective



Adaptive Canopy

Inspired from the research in Part One, the adaptive canopy aspires to confront and address the idea of the “new public”. Like the new public sphere which consists of changing point of interests and information flow instead of a hierarchical system (please refer to “Public Sphere in the New Media Era” in Chapter 2), the adaptive canopy acts as a public display screen, an unbiased portal of the digital realm, and also a physical manifestation of the virtual network. The voice inside the public arena is no longer limited to the elite or authority. Because of the digital network, everyone can be on the stage and share their public opinions with everyone. The adaptive canopy enables exactly that. Not only can people visit the New Tahrir Square by physically going there, but also by visiting the virtual website which allow digital input into the adaptive canopy. The canopy becomes a mutual platform situated in between the physical world and the cybernetic one, and allows visitors from both sides to interact and to participate. Any topic that sparks collective interests can be presented here. As the canopy is able to change its form, it follows the point of interests which is peddled among the people from both realms.

The adaptive canopy is a dynamic tensile structure that responds to the wireless electrical signals emitted from the handheld devices used by the

Figure 4.23

Canopy configuration plans. The canopy is able to change its form depending on the digital information transmission from the people underneath the canopy. On far left: the canopy in its equilibrium state.

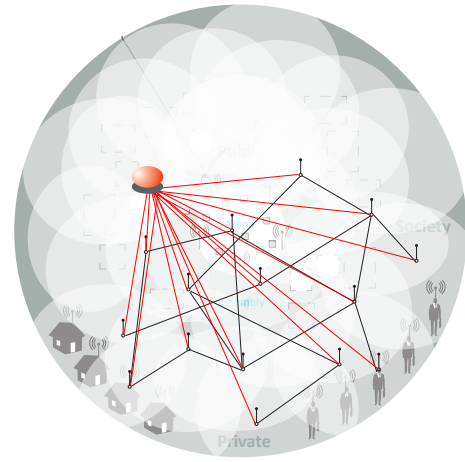


Figure 4.24

The design concept is to address the new kind of public mass, which is defined not by a group of people, but by information flow and point of interest.

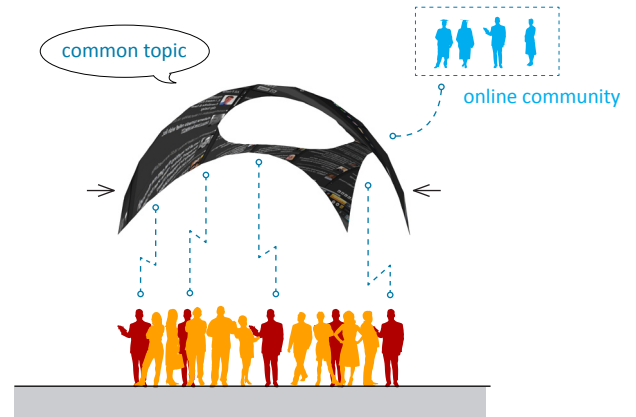
people underneath the canopy. It changes its form and porosity according to the intensity of digital information transmission. When more people in the open public square interact with the digital network through their mobile phones, the canopy directly above them concentrates on top to form a bigger cover. Depending on numbers of the groups underneath, the canopy could form one or many concentrated points. When no one uses mobile phones, or when the digital activities underneath the canopy are saturated, it is transformed into an “equilibrium state” where the porosity is evenly laid out (fig. 4.23.).

To be able to mediate the public in both the physical and digital realms, an interface must be designed to bridge the material and the immaterial. The adaptive canopy is the linking architectural component that allows the immaterial to have a material presence, and at the same time permits the material to be as dynamic as the immaterial. Tensile structure combined with movable structural components can achieve that. At the perimeter of the open public square, mechanical columns which move in a track provide the flexibility of the changing form of the canopy (fig. 4.26.). As they move around the site, the cable guide on top of the columns either contract or release to ensure constant tightness of the cable web above. Moving along on the cable web are the mobile anchor points which functions the same as the columns on the perimeter, but without disturbing the open space below. Inside each of the mobile anchor points are the electronic devices used for receiving, compiling, exporting, and translating data into either movement or visual projection. It is where the images are projected from, and displayed onto the surrounding surface of the canopy.

Method One

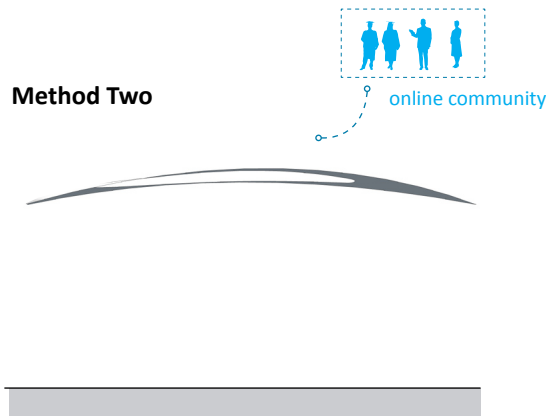


The participants gather at the square for particular common purposes such as demonstration or celebration. As they interact with their electric handheld devices, the canopy detects and responds to the wireless information.

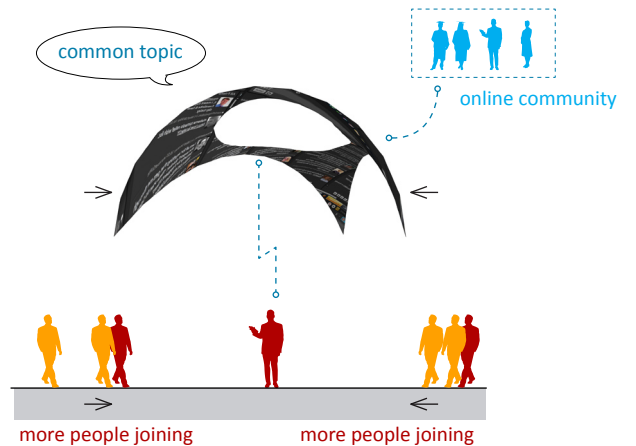


As more people use their handheld devices to communicate with the digital network, the canopy becomes denser to create more surface area for visual projection. Both digital and physical participants are able to display their expression onto the canopy.

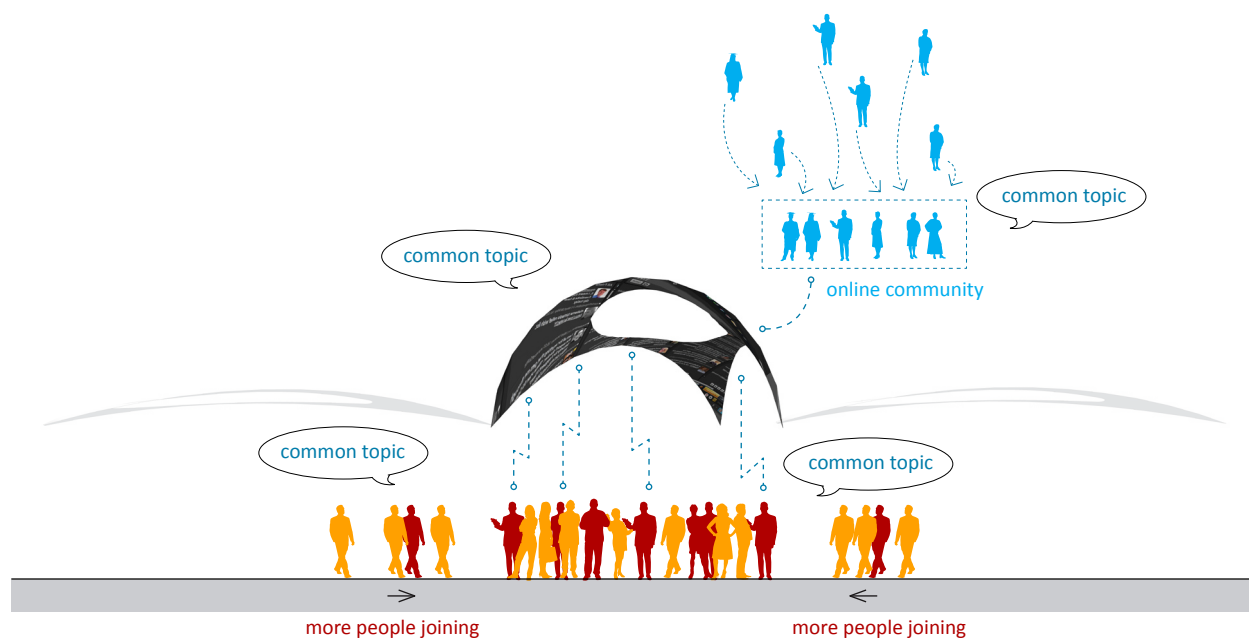
Method Two



Through websites of Tahrir Square, online community can inject public opinions onto the canopy and select the location where it will be displayed.



Physical participants are attracted to the interested topic, and choose to further communicate with the digital network or express their opinions through their electric handheld devices.

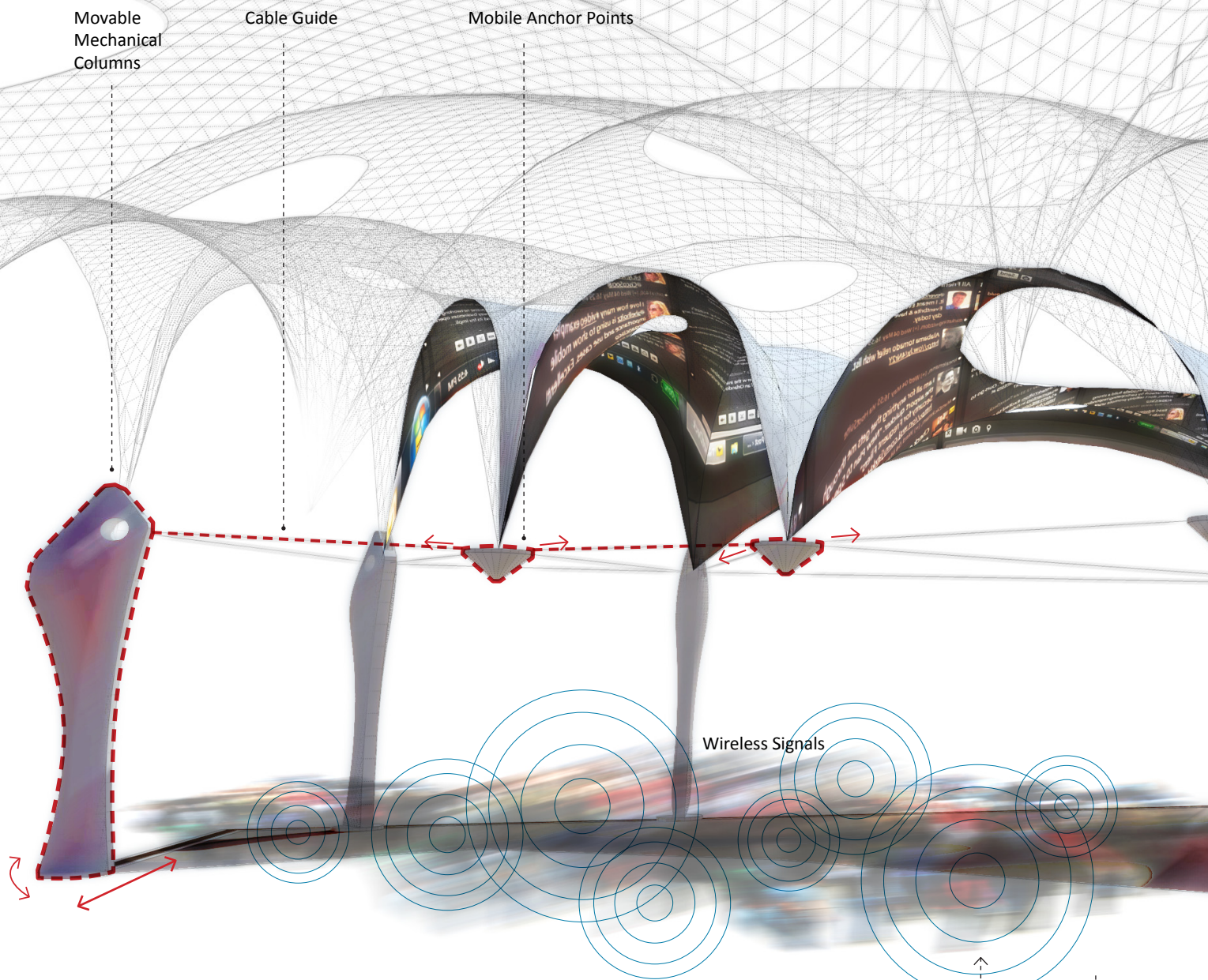


Adaptive Canopy Concept Diagram

The resulting space is a mixer of social engagement between the physical public and the virtual public communities. This spectacular interaction in large scale will further attract more people to participate in the relevant topic. As a result, the public experience is mediated and enhanced by the participation through both interaction with the canopy and the collective presence. With the adaptive canopy, the physical public is supplemented by the online network and the digital public is grounded by the physical presence of the people.

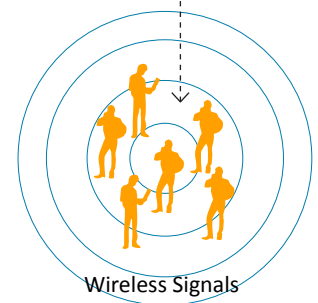
Figure 4.25

Adaptive canopy concept diagram



Sectional Diagram

As the mobile anchor points or the mechanic columns move closer to one another (columns move on tracks, and mobile anchor points move on cable guide web), the tensile structure that ties them together receives compression force and bulks up, creating a higher volume of the space underneath and more surface area for visual projection. On the contrary, if the tensile structure receives tension by separating the structural points, it stretches, forming a very thin strip of fabric and also allows the cover to be more open up to the sky (fig.4.26., fig.4.27.).



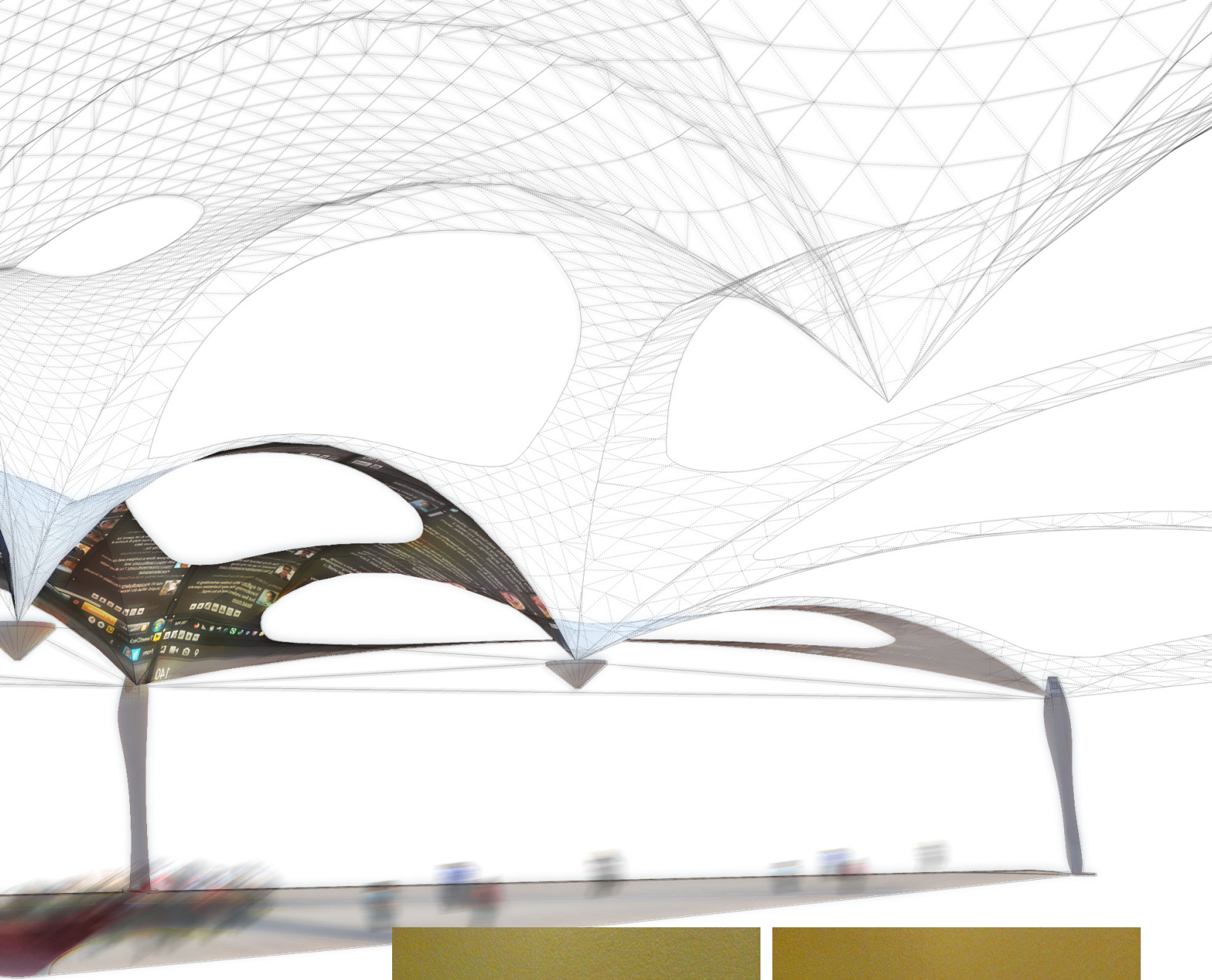
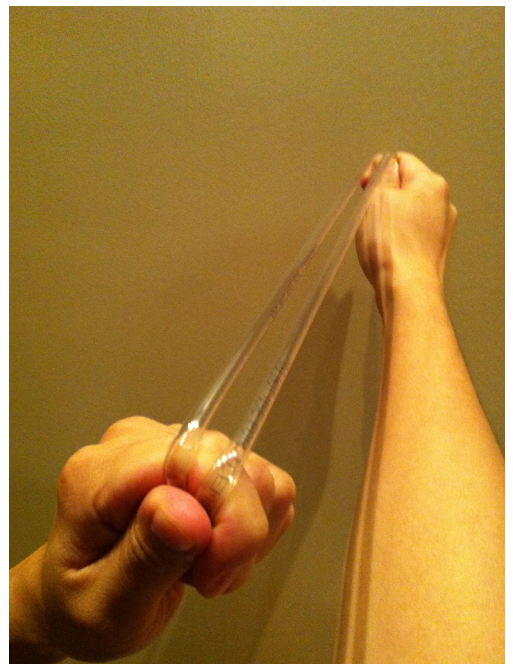


Figure 4.26

Sectional Diagram

Figure 4.27

Model of the tensile structure (without fabric skin)



Adaptive Canopy Configurations

The canopy configuration is constantly changing. There is no pre-defined layout except when the canopy is at its “equilibrium state” (fig.4.28.). It occurs when either the wireless transmission is at its lowest or saturated. In other words, when all the space is filled with people in the New Tahrir Square, and when they are all using mobile phone or handheld devices, the canopy goes back to the equilibrium state and will not move. On the contrary, when the mobile phone activities is at its lowest, in a situation such as midnight when no one is around, or in a event that prohibit anyone to use mobile phone, the canopy also shifts into the equilibrium state. A good example of such event would be when Muslim prayers all gather at the square and pray. Although the square is packed with people, the canopy will stay silent. Interestingly, the repetitive arches of the canopy at its equilibrium state also represent the typical bays in a Mosque. The spatial configurations of the canopy not only address the new digital public, but also tie back to the traditional usage of the physical space.

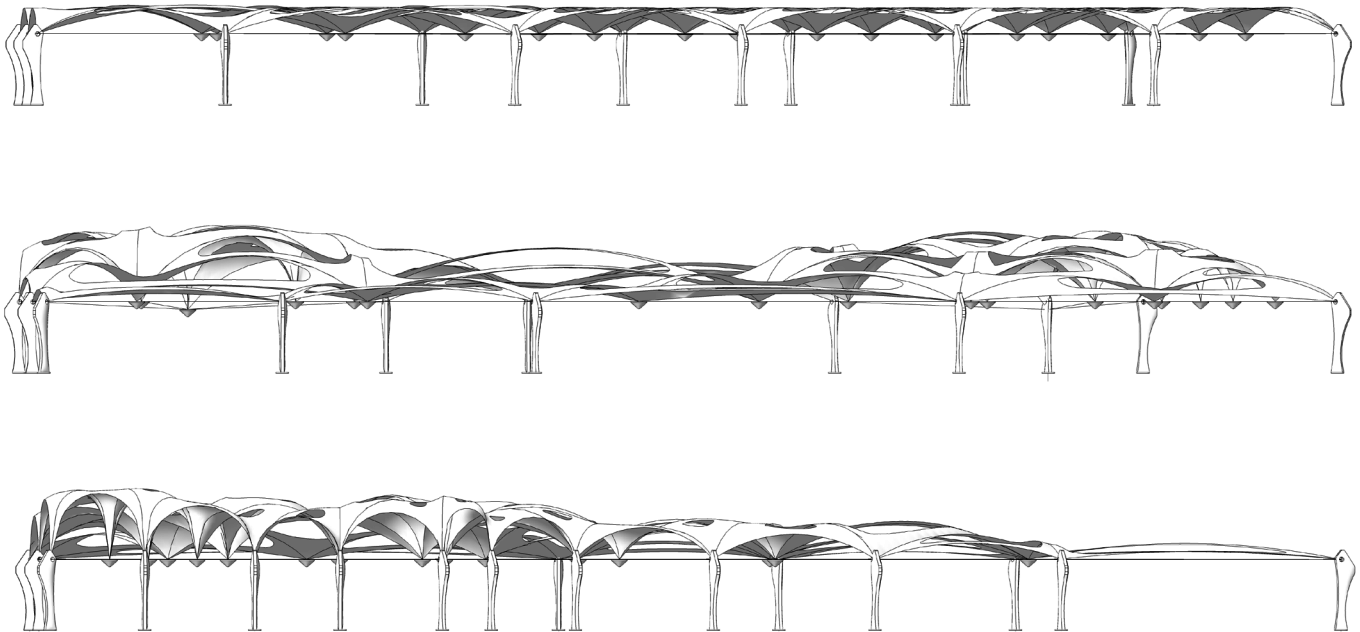
Figure 4.29

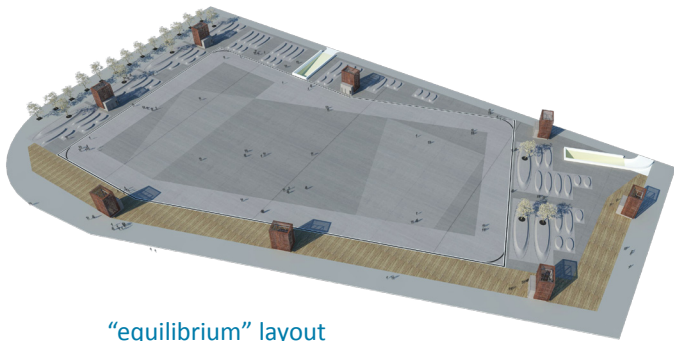
The architectural language is similar to a Mosque when the canopy is at its equilibrium state.

Figure 4.28

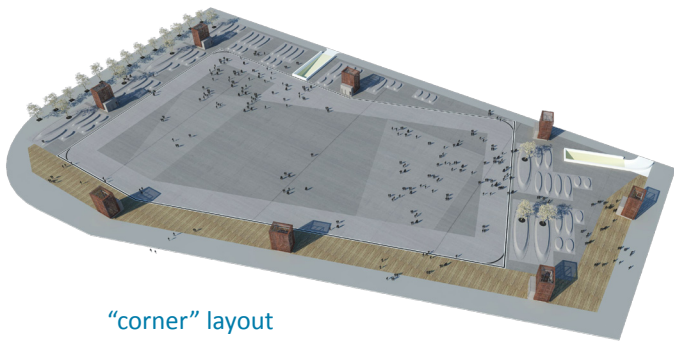
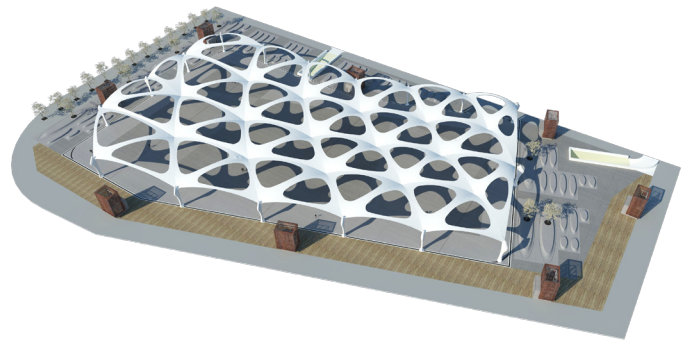
3 configurations of the adaptive canopy.

east elevation

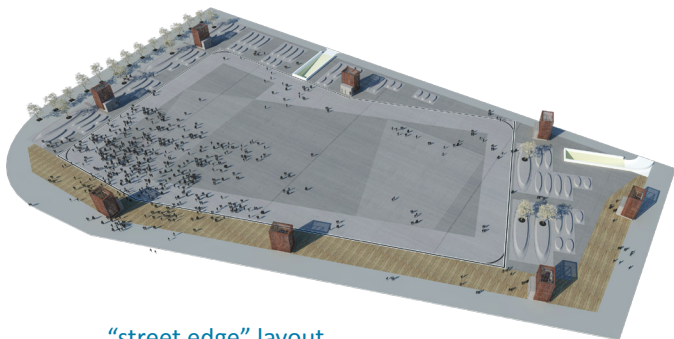
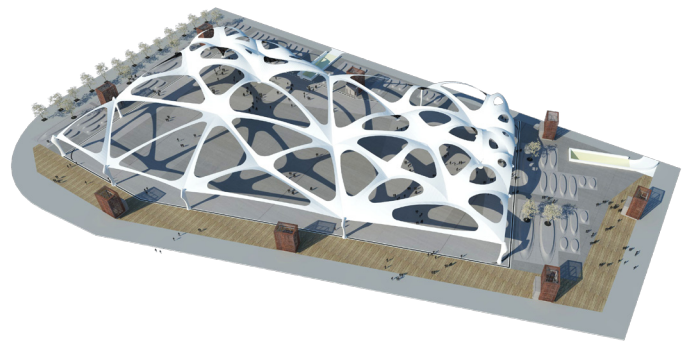




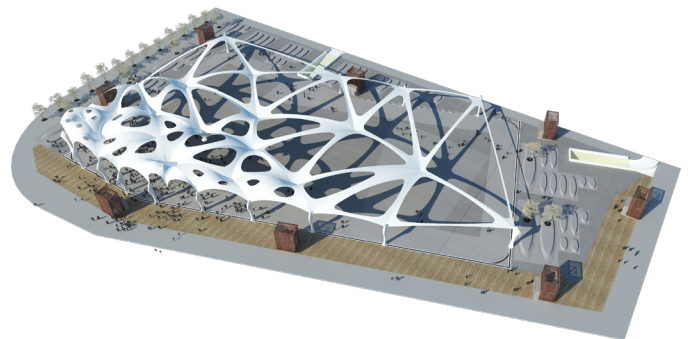
“equilibrium” layout

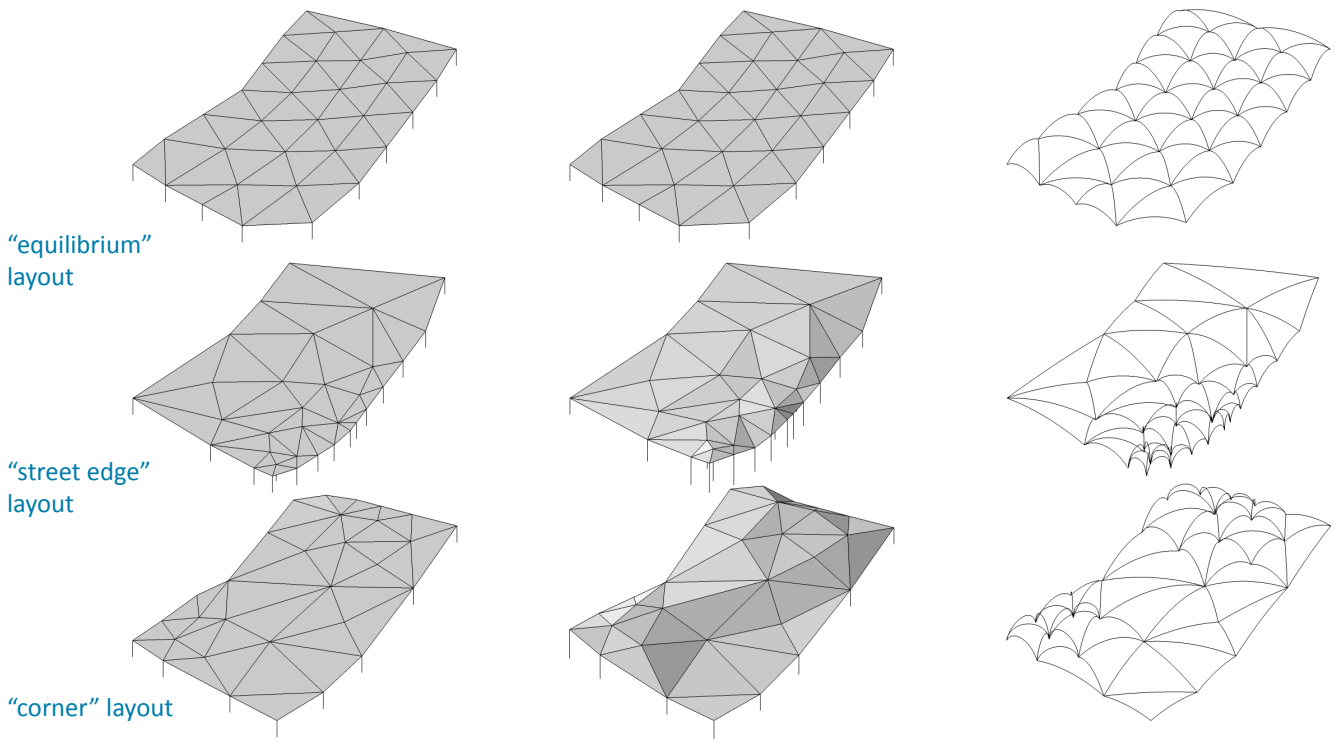


“corner” layout



“street edge” layout





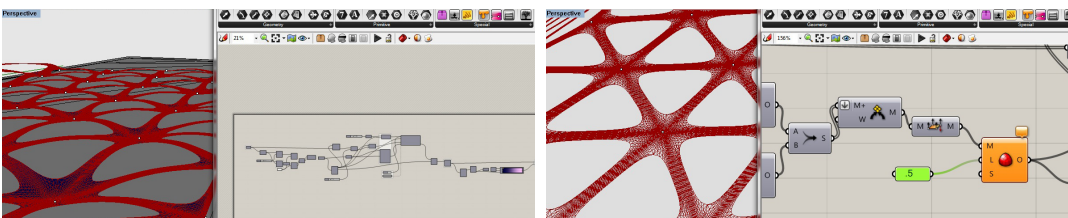
1. Define intensity based on the predicted crowd behaviour underneath the canopy.

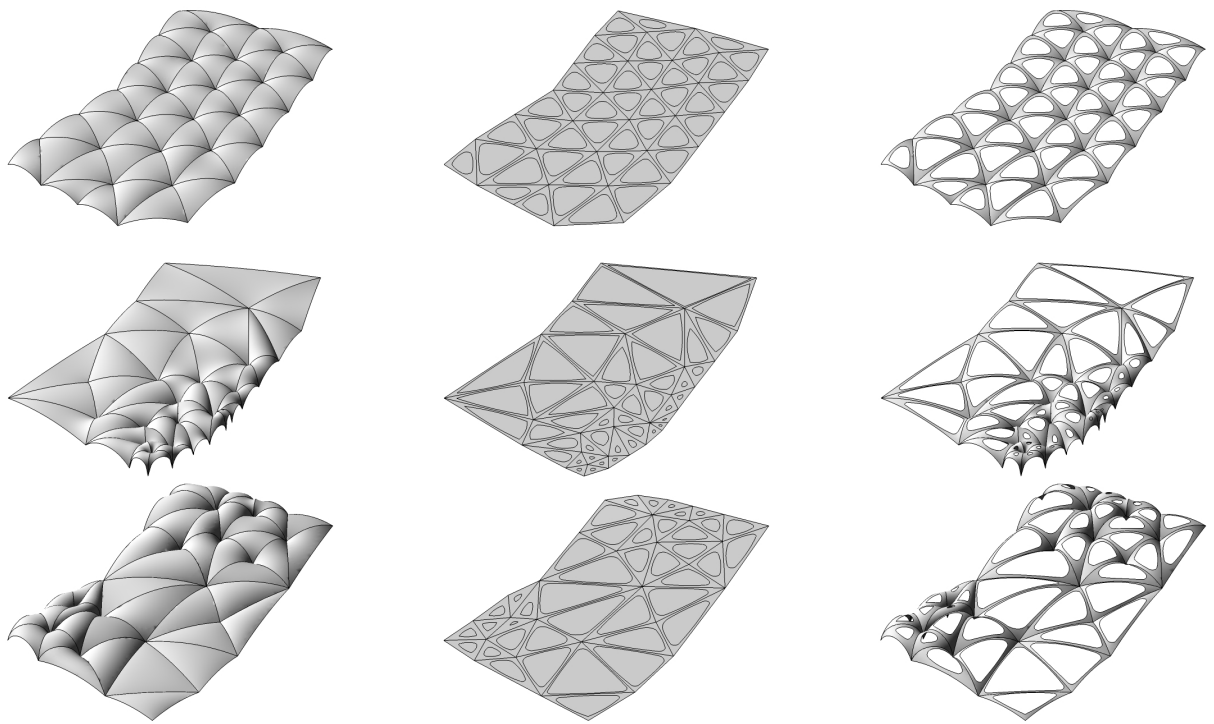
2. Generate various heights based on the intensity in specific points.

3. Generate arches between the points at the given heights.

Figure 4.30

A series of form generation exercises are done through Grasshopper in Rhino. It allows me to understand the crucial process to generate the desired form. However, the end result is generated from other 3D software.





4. Generate skins. The degree of gravity depends on the area of the skin - the smaller the area, the more bulky it is.

5. On separate plans, define the degree of stretch depending on the area of the skin - the bigger the area, the more stretch that the fabric will represent.

6. Intercept the bubble skins with the porosity of the canopy.

Figure 4.31

Steps to generate the 3 configurations of the adaptive canopy.

Form Generation of the Adaptive Canopy



A Walkthrough of the New Tahrir Square

A fictional character Ahmed is introduced to provide a walkthrough of the New Tahrir Square.

Ahmed loves Jazz. Although there is a Jazz festival every March in Cairo, there is a famous Japanese musician that has never visited Egypt. Ahmed wants to gather people who share the same interest and invite this musician here to perform. He blogs and email about this. And from a home desktop, he writes some messages in the New Tahrir Square website. They will be displayed on the actual canopy on top of the open public square.

The day after, Ahmed, more curious than ever, leaves his home to visit the square to meet people who also share his interest. As he arrives at the square, the closest crowd seem to be engaged in a heated discussion, and as he look up, he realizes that they are gathered here to discuss the new government reform and who should be in charge. Amongst the group, he sees that some people are shaking hands, some people are debating quite loudly, and some people are looking up at the canopy, communicating with the people online. Ahmed leaves this group to find what he came for, although he does get to know a bit more about the current political intention simply by just walking by, hearing their conversation, and looking

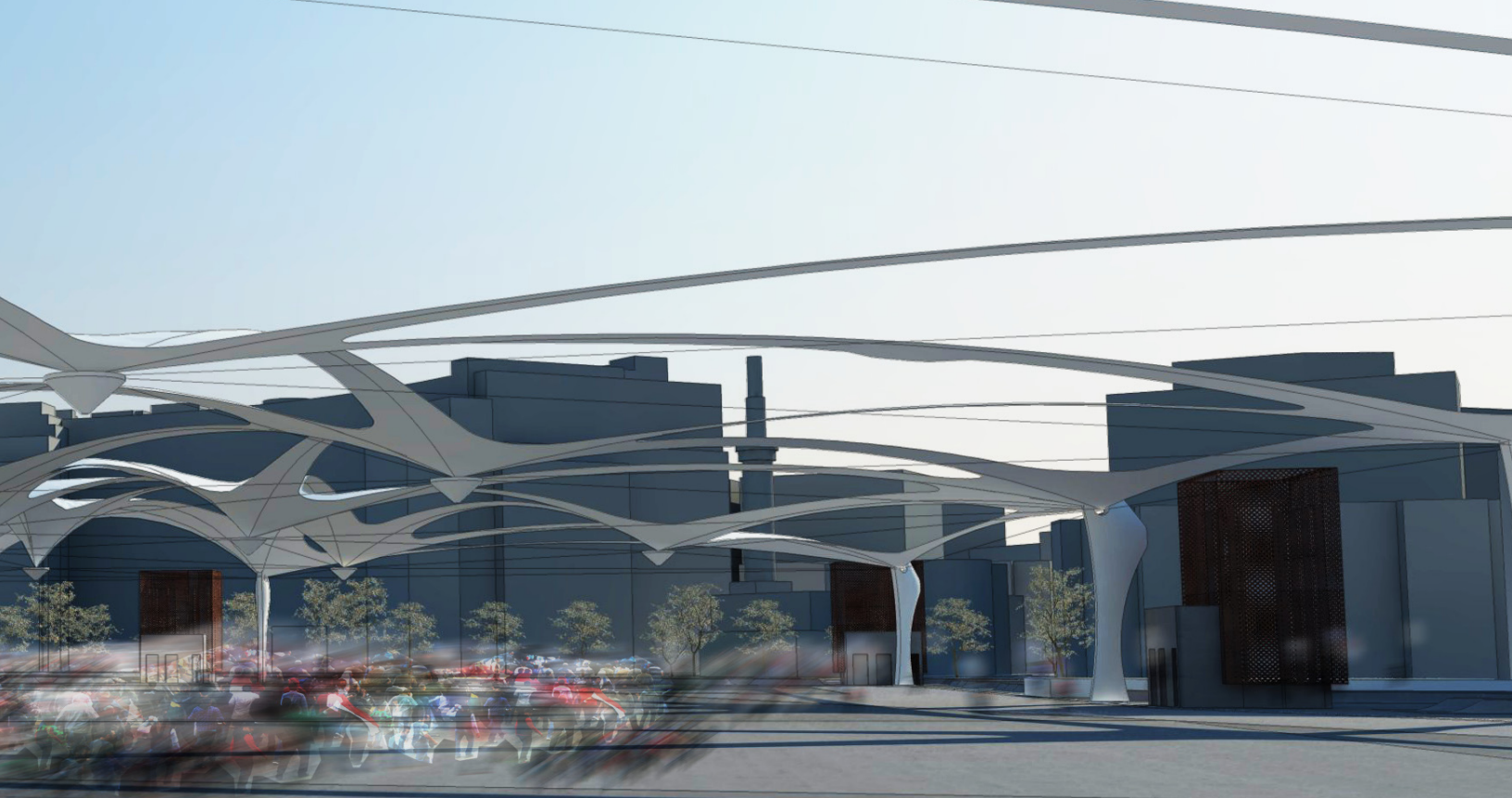


Figure 4.32

Perspective Rendering of
the New Tahrir Square.

at the messages displayed on the canopy.

Finally, he finds his “physical blog space” somewhere closer to the south side of the square. Several people are already gathered there. Ahmed joins them, and discusses about the musician’s music, and how might they invite her to perform here. As times goes by, more people come by and join the group. They never thought this many people actually love this musician. The canopy attracts more pedestrians who see the musician’s name on the canopy and join either for common interest or simply out of curiosity.

As more people gather and message their friends about this impulsive gathering, the canopy on top of them closes in. More messages are displayed on top from all over Egypt. Bloggers, at home, communicate with the people at the New Tahrir Square in real-time.

Suddenly, someone sees the musician’s response on the canopy, she writes how happy she is to know that this many people like her music in Egypt. Because of the built in camera in the mobile anchor point, she is able to see all of them who are gathered at the square. Finally, as spontaneous as it is, although she is in Japan, she performs a song over the internet and is broadcasted live in the New Tahrir Square.



Figure 4.33.

Aerial Perspective



Conclusion

In today's digitalized age, we can appropriately agree on the simultaneity of the world. The public sphere that we knew about has been given a new definition – a digital one. However, this latest social phenomenon propelled by the advancing ICT weakens the experience of both time and place. It uproots us from our ties with place and urban public space. From the first design intervention the City with No Street, the thesis initially explores the dystopian tendency in the use of ICT in architecture. The experiment allows me to use the design as a critique and illustrates the subversive qualities of space if we become too dependent on the communication technology that we have created.

Further along the research, projects such as Fun Palace and New Babylon (see appendix) inspired me to adopt ICT in architecture that will be able to respond to social behaviour. What was impossible and purely visionary before seems like a realisable idea with today's technology. The concept is to create a space that can be reconfigured and reorganized based upon people's changing needs. The second design intervention, the New Tahrir Square, addresses the new public mass and at the same time makes use of a hybrid of the physical and digital public space. It aspires to be truly "public" by suggesting a new form of architecture that situates itself in between the material and the immaterial.

As with many designs, the New Tahrir Square has its limitations. Because of the tracking mechanism of the adaptive canopy, it can also be perceived or used as surveillance and a tool of control. The real question relies on who is using the space and for what purpose. If consumerism takes over, the canopy could become the ultimate advertisement machine that brings customized ads for each individual depending on their behaviours and tracked preferences. If a totalitarian government takes control of the canopy, it can be used as a super police force that watches everything you do at a public space. Having mentioned this, however, we must not forget the potential to be used as a catalyst for public social engagement. Take Hussmann's boulevards in Paris for example, it was initially designed to efficiently transport armies into the city. Interestingly, the boulevards today have come to be known as one of the most successful public spaces there are. Therefore, as a design experiment, the Tahrir Square aims to create a new type of "place" that not only rejuvenates the physical space, but also mediates the public experience in both the physical and digital realms.

APPENDICES

Visionary Architecture and the Century of the Self

In visionary architectural projects throughout history, we can see architecture as a form of passive repression used to launch top-down authoritarian social reform. Visionary projects such as Charles Fourier's Phalanstère (1808) and Le Corbusier's Ville Contemporaine (1922) were created to address social problems by applying a rational layer, completely covering up the existing city which was filled with chaos and disorder. This coincided with Freudian thinking which suggested that the unconscious mind of the individual was primitive and dangerous, and therefore must be confronted with so-called "civilization" – in a way, a mechanism of repression (Curtis, 2002).

Following the success of the Industrial Age, mass consumer culture arose in the beginning twentieth century. The people in that era were not considered as "citizens", but as "consumers" (Curtis, 2002). Bernays, the father of "public relations", who was also the nephew of Sigmund Freud), applied his uncle's idea of the individual mind to the study of crowd psychology. He realized that, by feeding people their unconscious desire through the help of mass media, he could control the behavior of the crowd, especially in persuading the public to purchase certain consumer products (women who lit up a cigarette were to light up a "torch of freedom") (Curtis, 2002). Consumerism in the end was used as a type of crowd control mechanism, and mass production eventually undermined individual personality and character. What we bought or wore defined us. As the result, groups of progressives began to protest and advocated the liberation of the self by proposing visionary architectural projects – among them were Constant's New Babylon (1956-74) and Cedric Price's Fun Palace (1962). The two projects were trying to promote the idea that the urban dynamic should not be driven by the products that we buy and the television shows that we watch, but by everyone's participation in the

experience of the city. Ultimately, they aimed to create a place where the true public is uncovered from the capitalist avalanche.

Paralleled with the social resistance was the progression of self-awareness and self expression within the society in the late '60s. During this time, the nature of the consumerism was changing: people no longer purchase items to "fit in", but to express their values and lifestyles. Even politics were influenced by the marketing strategies: instead of promoting policies to the public, they were "tailored" to meet what the targeted groups" want (Curtis, 2002). Individualism was on the rise, and we for the first time were the bosses of ourselves. Consequently, along with the technological advancement, mass production smoothly transited into mass customization and lifestyle culture.

Groups of architects such as Archigram (Michael Webb, Peter Cook, and David Greene) promoted, and in fact embraced the Spectacles created by the new consumer culture. Their projects such as Plug-in City (1962-64) and Suitaloon (1966) not only suggested the importance of the individual mobility and consumer spectacles in architecture, but also incorporated mass customization and the cybernetic world in their visionary cities.

However, by the end of the 1960s, the optimism of the self was already failing. Along with individual freedom, modernity brought social fragmentation, alienation, and exclusion. For the first time, architects employed visionary projects to illustrate the potential failure of our society critically and metaphorically. Superstudio and Archizoom, in their ironic project The Continuous Monument (1969-71) and No-Stop City (1969), told a dystopian world in an extreme trajectory of the mass culture, globalization and individualization.

Also came out of this social transformation and the rise of the individual power was the invention of the cybernetic space and the virtual world at the end of 1980s. The ability for one to be disembodied with the physical world and liberated from the geographical location creates a whole new parallel universe that one could be submerged in. To the emerging community which consists of isolated and detached individuals, the potential to express one's inner self in the cybernetic world is limitless.

At the prime of the information age, it seems like the world of electronics and the digital network is taking over the city. Robert Venturi who is the author of the two influential articles: *Complexity and Contradiction in Architecture* (1966) and *Learning from Las Vegas* (1977) agrees. He suggests that Americans do not need piazzas and public space anymore because they would rather be at home watching television (Wigley, 2002). He even further emphasizes in his research on architecture in Las Vegas: “architecture of communication over space, communication dominates space... if you take the signs away, there is no space” (Wigley, 2002).

This dramatically altered the way we envision about the architectural discourse. While the traditional domain of architecture is about defining boundaries, a space of containers, or places, digital network establishes linkages and infinite flow. The immateriality freedom further isolates the individuals to their surroundings in the material world. With people locked into televisions at home and their personal mobile phones in the public space, public engagement is no longer a physical but a virtual phenomenon.

However, at the beginning of the twenty-first century, information communication technologies that enhance public interaction appear. Things such as mobile navigation tool incorporated with public suggestion allow an individual to easier stroll through the city (such as Google Map). Different than reading a paper map with written suggestions, the user is projected onto the digital map in real-time while traveling through space, receiving instantaneous updates from the public. During his journey, he could also share his experience with the public through the digital network.

The feedback loop continues to update and revise in real-time, and perhaps simultaneously analyse and learn about the public, in which the information will then be useful to generate future commercial, political, social, or creative activities in the city. Visionary architectural installations such as *Open Column* (2007) by Omar Khan and *Hylozoic Soil* (2010) by Philip Beesley provide insight on how architecture could also respond and adapt to its inhabitant and generate social and environmental possibilities.

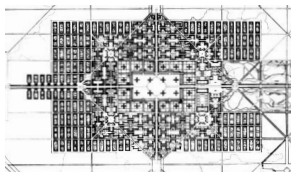
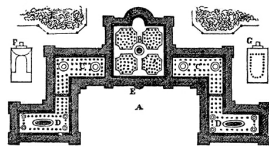


Figure a.01.

1. The Rational Cities: Phalanstère & Ville Contemporaine

The Phalanstère (1808) was an architectural concept conceived by Charles Fourier, who was a utopian visionary and an influential philosopher on social order and communal theory. The project consists of a massive, singular architecture which was designed systematically to incorporate all levels of society, creating a self-sustained community all within one structure.

The objective of the Phalanstère was to provide an architectural solution for a society which suffered from corruption, poverty, and lawlessness during the nineteenth century. Thanks to money he inherited from his father, Fourier was able to travel across the whole of Europe when he was young. While traveling, what he saw deeply disturbed him – devastated by the revolutions and the civil wars, the whole European continent was infested with poverty, strife, and chaos. As a recovery plan, Fourier proposed that the only way for society to piece itself back together was to support public concerns and cooperation between individuals. To aid in social reconstruction, a four-storey building was to be set up and to house both the rich and the poor – the richest had the uppermost floor and the poorest resided on the ground floor (Roberts, 1995). A person's wealth, however, was determined not by one's monetary assets, but by the type of job that one acquired (tied back to the cooperative nature of the Phalanstère).

Figure a.02.

The Phalanstère was a vision of the unification of space and architecture with the social body (Sadler, 1999). The building complex was comprised of three major sections: a central part, which hosted quiet activities such as dining rooms, libraries, and meeting rooms; a productive part, where noisy activities such as carpentry and workshops were housed (it was also where the children were, not only because they were considered as a “noisy occupancy” but also because Fourier believed that children as early as age two should be familiar with industry and the work environment); and finally, a residential part consisted of a hostel and a lobby to host occupants and also greet visitors.

Like the Phalanstère, the Ville Contemporaine (Contemporary City) by Le Corbusier also suggested an architectural answer by reforming the city as a whole. The Contemporary City (1922) was a rational approach to reconstructing the city by reconfiguring public and the private space, reestablishing the working class, and enforcing zoning (instead of program planning as within the Phalanstère, Le Corbusier employed land use planning). And in order to do those, a large portion of the existing city must be erased to make way for the new development.

Celebrating the technology of the industrial age, the Contemporary City embraced steel frame high-rise buildings and fuel-powered transportation. At the very centre of the city was a large transit hub which incorporated all types of transportation, from bus and train stations to expressway interchanges to a rooftop airport. The love of the automobile allowed Le Corbusier to segregate the pedestrian pathways from the street and glorify

the vehicular roadway as the most important way to move through the city.

Zoning was strictly enforced. There were clear distinctions of where offices, industry, and apartment blocks were located. Influenced by the Garden City of Ebenezer Howard, Le Corbusier also set apartment blocks far away from the roadway, leaving vast areas for green space. The reconfiguration of the public space resulted in isolation and segregation among the individuals. Like the Phalanstère, class-based stratification was used as the systematic arrangement of the space, but at the scale of a city (Contemporary City was designed to house three million inhabitants). As a result, the urban life in the Contemporary City was completely manufactured, or even compromised in order to provide a rational way of living. Robert Hughes, former art critic for Time magazine, commented on the Contemporary City in his book *The Shock of the New*:

“...the car would abolish the human street, and possibly the human foot... the one thing no one would have is a place to bump into each other, walk the dog, strut, one of the hundred random things that people do... being random was loathed by Le Corbusier... its inhabitants surrender their freedom of movement to the omnipresent architect.” (Hughes, 1991)

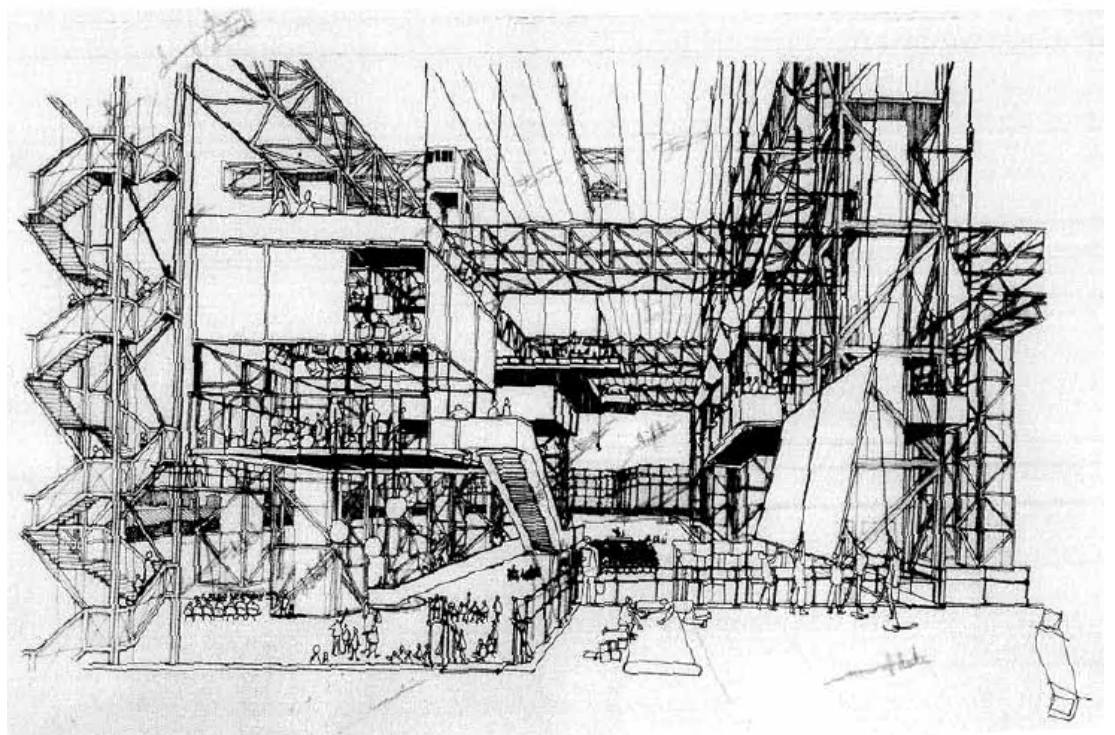


Figure a.03

2. Social Experimentation: New Babylon & Fun Palace

As the twentieth century progressed, architects started to question the social restrictions and the urban zoning which transformed the city into obstacles to real democratic life. They also started to express concern about the bureaucratized capitalism which tended to consume people's independence and creativity. Guy Debord, the founder of the Situationists, stated in 1961:

“The new prefabricated cities clearly exemplify the totalitarian tendency of modern capitalism's organization of life: the isolated inhabitants... see their lives reduced to the pure triviality of the repetitive combined with the obligatory absorption of an equally repetitive spectacle.” (Sadler, 1999)

Figure a.04

The leftist group the Situationists, comprised of artist, architects, and thinkers, quickly assembled for one purpose: to reveal and overcome the consumerist fragmentation of society and its passive tendencies towards social exclusion (Spiller, 2007). Some tactics were developed to aid the manifesto – the *dérive* (drift), psychogeography, unitary urbanism, and *détournement* (misappropriation) (Sadler, 1999). In short, the *dérive* was a rational attempt to experience the multi-dimensional ambiances of movements, spaces, and places in the city, whereas psychogeography aimed to relate an individual's emotion and experience to a particular geographical location. Another organizational method was the *détournement* – the assimilation, reuse, and redirection of the space and the city itself (eg.,

holding lectures inside a shopping mall). All these were to result in the unitary urbanism which would end the capitalist contest for space, and prioritization of circulation in order to organize the city for the enrichment of everyday life (Sadler, 1999).

Deeply influenced by those tactics, Constant Nieuwenhuys, one of the protagonists in the Situationists, began to develop his eighteen year-long visionary urban project – New Babylon (1956-74). The project was never a final outcome: at the early stages the megastructure soared above the whole city fabric, with its “legs” anchored at the ground while the huge cantilever of “space” continued to expand. The design was to incorporate the ephemeral and diverse features of the city and also to support flux of playful animated ambiances. New Babylon was the urban architectural response to the Situationists’ manifesto.

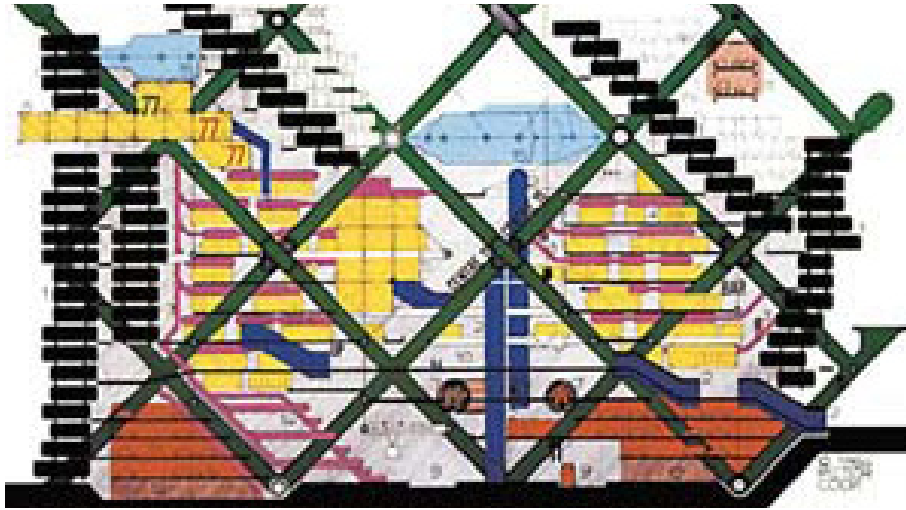
However, New Babylon stayed at the state of conceptual declaration rather than dealing with hard realities. Throughout the experiment, there were few specifics dealing with spatial conditions, form, and even social ramifications. The project lingered between abstract art and architectural representation, and as time went by, New Babylon only became more questionable and confusing. Finally, the concept was abandoned.

Around the same time, England began to deal with the mass consumerism and the control of authority after the post-war boom. Rather than the pyrotechnic artistic approach of New Babylon, Cedric Price and Joan Littlewood’s Fun Palace was far more accurate and descriptive. (They even sorted out fire regulation for the project). They conceived the Fun Palace

as a community-driven playground where middle class people could go and discover whatever they desired (Spiller, 2007).

Fun Palace not only addressed a kind of social reform, but also incorporated multimedia and construction technologies into the project. The flexible and open nature of the program created a structure that could be reconfigured and reorganized based on people's interests. To achieve this, cranes and movable shipping containers were introduced while the structural framework itself almost seemed too light and too transparent, suggesting a building that was constantly changing and never completed.

Both New Babylon and Fun Palace focused on the collective's desires and interests, and thus created architecture that is dynamic and responsive to social and technological change. Instead of seeking to "repress" or "control" the human behavior in a city, such as the Phalanstère and the Ville Contemporaine, the role of architecture in this case was reversed: people and their behaviors were in control, and the form and shape was a result of our collective desires. Technology, be it mechanical or communicational, also helped to allow the individuals express themselves by constantly changing their spatial surroundings.



3. Digital Transmutation: Plug-in City & Suitaloon

Figure a.05

Other than New Babylon and Fun Palace, more visionary megastructures were purposed by the avant-gardes in the '60s, but for very different reasons. Conceived by Archigram from 1962 to 64, Plug-in City was another utopian visionary project proposed to address the rise of individual power. However, unlike New Babylon and Fun Palace, the center of the project was not about non-commodity socialism; instead, the project embraced the up-and-coming burgeoning technological advancement: the use of bright colors, pop culture, corporate identity, and lifestyle marketing were the characteristic often used by Archigram (Spiller, 2007). Like the Fun Palace, all the architectural components in the Plug-in City were able to be reconfigured and dismantled. Individuals were able to customize their capsules the way they like (or the way they purchased) which is then "plugged" into the overall megastructure of the city. The difference being that rather than having the spatial condition adapted people's collective behaviors, Plug-in City offered consumer choice.

Moreover, other than the mechanical and electrical systems which constantly updated the shifting spaces, Plug-in City kept the same zoning and hierarchical elements of a typical Westernized city. It was because the focus of the Plug-in City was not about reinventing the ideology of the capitalist urbanism, but about the choice of a consumer. As a result, the city was more of a massive framework, or a computerized machine that processed the independent beings as feedback loops. In comparison, New Babylon was created by the participation of the individuals much like a

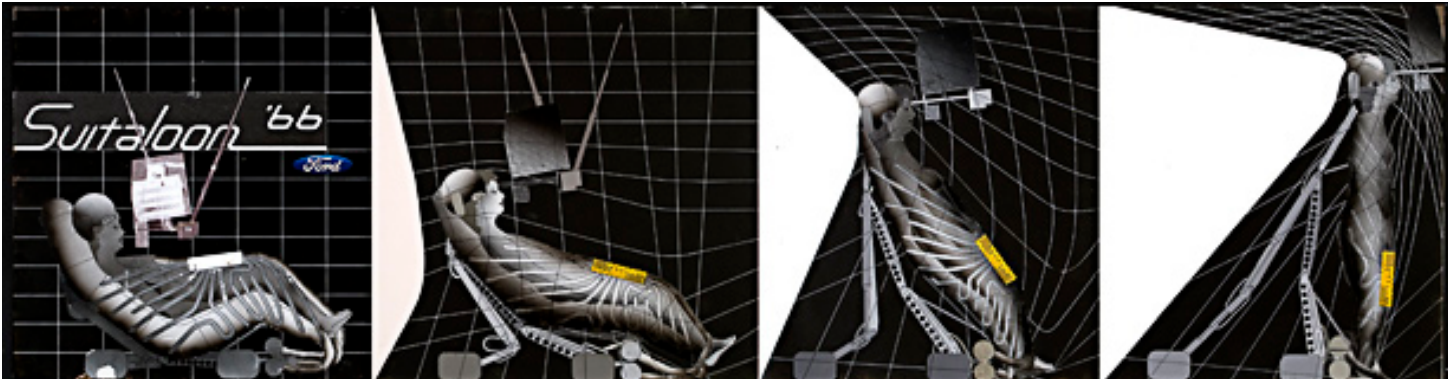


Figure a.06

macrotermitinae, whereas Plug-in City was more similar to the stacking shelves in a supermarket, holding various consumer products.

In 1966, Archigram pushed the idea even further. Mobility and individual freedom in the context of the consumer culture was pushed to the max. Both projects “Cushicle” and “Suitaloon” suggested an artificial environment that one could carry on his back, and be inflated into a immediate private space with the controlled temperature, multimedia portals which connected to the outside world, and basic hardware that a typical home would have (plumbing, lighting, etc).

To counter the hermetic ramifications, “plug” was introduced in each “architectural suit” in order to connect one private bubble to another, allowing the body to enter other’s private domain. However, it seemed like an afterthought and the logic behind the public sphere and the society was completely lost. The city is no more. What was left were bunch of colorful bubbles, disconnected and isolated from the rest of the world.

Interestingly, the suit bubbles that created separated universe of the individuals gave hint to the new information communication tools in the coming decades. Portable audio cassette player was invented in 1972 and personal handheld mobile phone went public in 1973. With both devices, one could now enjoy maximum mobility and individual freedom in the city very much similar to Archigram’s Suitaloon, without caring the immediate situations that were around and temporary cut off from the society.

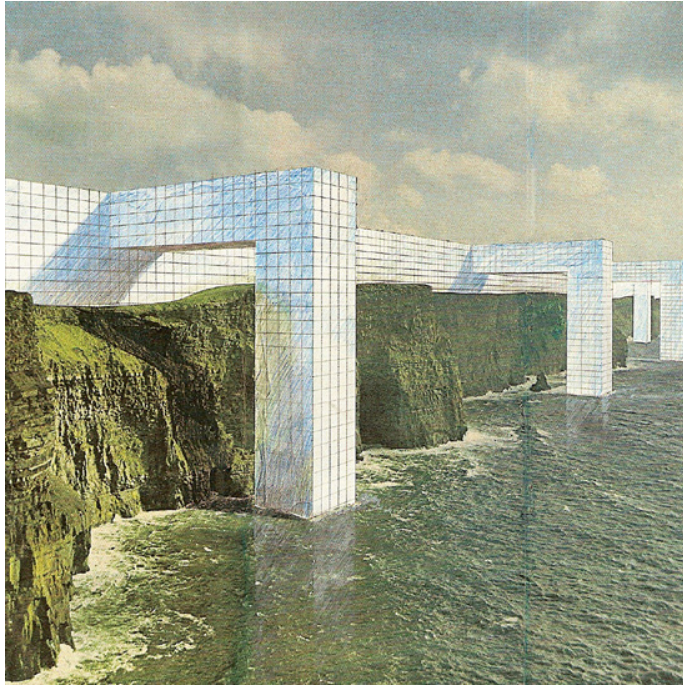


Figure a.07

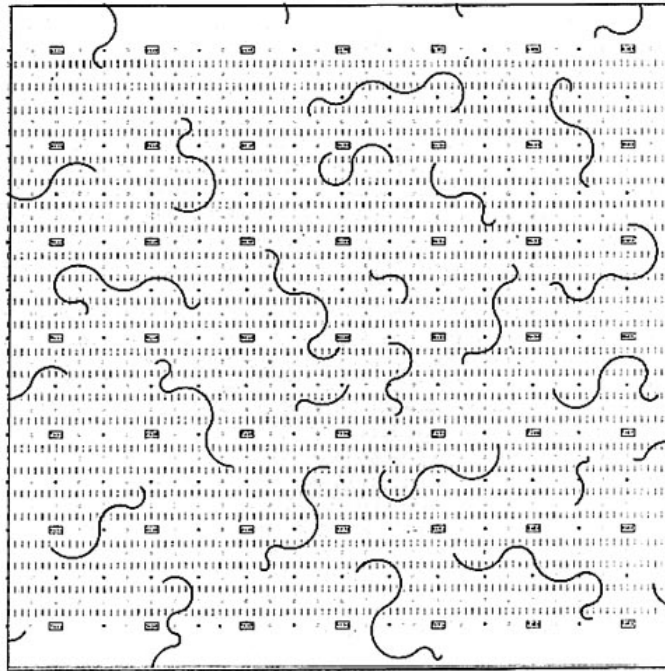
4. Critical Architecture: Continuous Monument & No-Stop City

Learned from the previous case studies, architecture was either problem solver, propaganda machine, or celebrated spectacle. Each of them to suggest a version of the better future; the roles of the visionary architecture were all designed toward certain level of optimism. However, people started to question about whether the optimism would really lead us to the utopian future, and whether those visionary projects were simply architect's uncritical egos of the status-quo. And by end of the '60s, avant-gardes started to produce architectural projects which were ironic, metaphoric, and shocking. The dystopian visual collages that they created were also meant to fuel debate and further evaluation of the contemporary architectural discourse.

Superstudio, in *The Continuous Monument* (1969-71), told a dystopian world which was completely covered by a massive three-dimensional grid structure which supported all senses, emotions, and desires of the human beings. It illustrated the consumer-led extreme and the unfailing appeal of the grid/cube and their implicit capitalist rationale of the machine production (Spiller, 2007).

On the other hand, Archizoom also undertook their experimental project

Figure a.08



on the urban environment, globalization, and mass culture – “No-stop City” was born in 1969. The “endless” city was laid out in a way that was similar to a car park or a supermarket, with its massive interior space completely artificially lit and air-conditioned. No-stop City had no characteristic, no permanent object, and no boundary. The individuals could establish his or her own housing conditions as a creative, freed, and personal activity (Torrents, 2007). In Archizoom’s words:

“Considering architecture as an intermediate stage of urban organization that has to be overstepped, No-Stop City establishes a direct link between metropolis and furnishing objects: the city becomes a series of beds, tables, chairs and cupboards; the domestic and urban furniture fully coincide.” (Torrents, 2007)

In the end, both projects shed light on how architects could develop critical thinking by the means of a project, as opposed to a written article. According to Bernard Tschumi in an interview, he talked about No-stop City and the Continuous Monument, “it was an ironic statement of extraordinary architectural intelligence; it acknowledged that, as an intellectual, one cannot change the system, only verify it and show where it is going. It also means that, paradoxically, one may someday find oneself in the situation of actually building one’s verification” (Walker, 2006).



Figure a.09

5. Responsive Architecture: Open Columns & Hylozoic Soil

As the networked world is not only about the virtual but also the physical, the cities that we inhabit become the new playground for the emergent social-techno potential. Responsive architecture is one of the visionary approaches to allow real-time interaction with the environmental conditions, and thus change the configuration, form, color, or function of the space. While temperature and solar sensor already existed in some buildings to control louvers or interior temperature, human condition and social behavior inside the space can also be recorded to adjust the spatial configuration.

Unlike New Babylon and Fun Palace in which the action of the architecture is directly controlled by the individuals or groups to fit to their desires, responsive architect is capable of registering collective resonance and act upon automatically and without bias. Here, it is not about fulfilling self interests, but about adapting collective behavior.

Open Columns, designed by Omar Khan in 2007, illustrates how architecture can become reactive not only to the physical environment, but also to the social condition. The installation consists of several non-structural columns in the middle of an interior open space. They operate gradually by moving the bottom of the columns upward or downward vertically. When they are

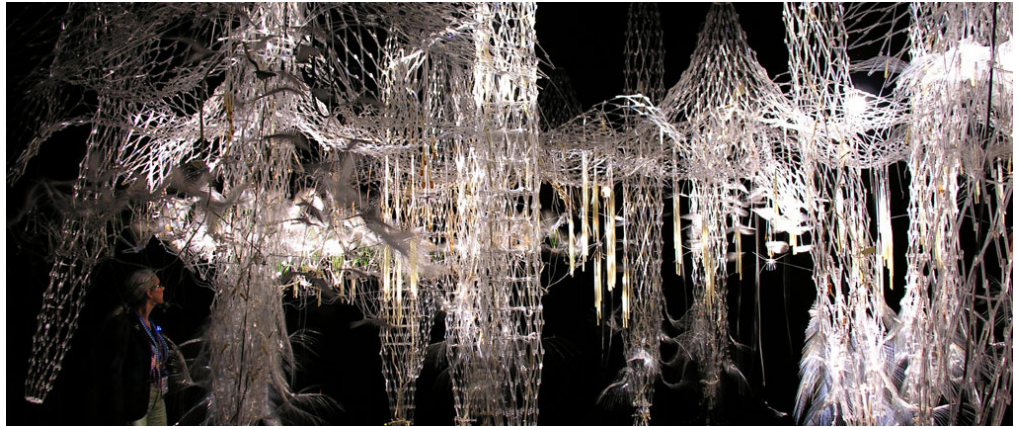


Figure a.10

fully deployed, the open space breaks into several smaller spaces.

What makes them responsive is that the configurations of the columns respond to the data collected by carbon dioxide (CO₂) sensors. If there are more people occupying the open space, the columns are programmed to lower when they sense high CO₂ level, forcing the crowd to disperse into smaller groups. On the contrary, if there are few people occupying the space, the columns will move up, inviting more people into the space.

A more poetic and metaphoric approach of the responsive architectural installation is Philip Beesley's Hylozoic Soil. The piece consists of hundreds of mechanisms which create an organic-like mesh that vibrate, move, or curl when detect moving object around them using proximity sensors. Chemicals are also used to simulate organic filtering and repairing process. Latex bladders containing digestive liquids are fitted with needles and tubes for injection and transferring materials within the system. According to Beesley, the layers of the Hylozoic Soil comprise of meshwork, structure, kinetic environment (the muscles), neurons, and the active circulation system. All of the layers work in a comprehensive way in order to create a responsive architectural system. And if we compress all the layers and tilt it vertically, we will have a "breathing" wall which has the potential to actively filter the environment and services a new kind of shelter (Noakes, 2010).

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