The Palace is no Fun

Disparate and Diffuse Ideological Backgrounds of Technologically Augmented Architectures

Master's Thesis for Master of Science
History and Theory of Architecture
Department of Architecture
Aalto University School of Arts, Design and Architecture
2020

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Master of Arts thesis abstract

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Title of thesis The Palace is no Fun – Disparate and Diffuse Ideological Backgrounds of Technologically Augmented Architectures

Department Department of Architecture

Degree programme Master's Programme in Architecture

Year 2020 **Number of pages** 85 **Language** English

Abstract

This master's thesis is a comparative analysis of four case studies which represent ideologies of technologically augmented architectures. The first two case studies are an artist's utopian vision of a city called New Babylon by Constant Nieuwenhuys and the prescient cybernetic plan for the Fun Palace by architect Cedric Price, both taking place in the 1960s. These projects are then juxtaposed with two smart city projects under construction at the time of writing this thesis: Masdar City in Abu Dhabi and Songdo in South Korea.

The goal of this thesis is to trace the ideological backgrounds of the aforementioned case studies and to explore the ideological development of this technological mindset . How are the projects presented by their background organizations and designers? What kind of values do they claim to represent and can these values be found in the actual designs? Do contemporary smart cities put civic life first or are there other motivations behind their conception?

New Babylon was to be an environment for a nomadic human existence that would consist of infinitely variable spaces with controls to alter atmospheres. Fun Palace was an enormous machinic building, with cranes and other devices making it possible for visitors to rearrange every part of the structure. Neither projects would look the same from one day to the other, but would be everchanging in nature. The projects were never realized. The former remained one artist's single most comprehensive project spanning more than a decade. The latter did file for building permits and had hundreds of people involved in its design process but eventually never got built.

Masdar City and Songdo are so-called ubiquitous cities that share many qualities. They are both cities that are not retrofits of already existing urban fabrics, but are built from the ground up. Smart grids and infrastructures embedded with digital sensors are built into the fabric of the cities from the start. Both cities claim that this will not only provide for efficiency and controllability of resources and utilites, embedded technology and computation will also substantially cut emissions and create a better functioning civic environment.

The research points out a difference between stated and unstated goals of the contemporary cases compared to the historical ones. All of the cases are envisioning environments where technology is embedded into the built environment, enabling new kinds of interactions between citizen and city. In the earlier cases the goal was to create environments for the creation of a critically engaged citizen. Most notably, they would put the citizens themselves in charge of their environments. In the contemporary cases the control is put in the infrastructural systems and their operators. At the same time, the legibility of the existence of these infrastructures is obscured. The shape of urban environments remains conventional and the underlying systems that sense, compute and enact on citizens behalf disappear from citizens' perception.

These layers of infrastructure and intensions, both visible and hidden, stated and unstated, suggest that there is more than meets the eye to the technological optimism of the smart city movement. Examining past visions of technologically augmented environments offer us a point of reflection for the values at play in these kinds of developments today.

Keywords smart, ubiquitous, city, cybernetics, algorithms

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Taiteen maisterin opinnäytteen tiivistelmä

Tekijä Antti Auvinen

Työn nimi The Palace is no Fun – Disparate and Diffuse Ideological Backgrounds of Technologically Augmented Architectures

Laitos Arkkitehtuurin laitos

Koulutusohjelma Arkkitehtuurin maisteriohjelma

Vuosi 2020 **Sivumäärä** 85 **Kieli** Englanti

Tiivistelmä

Tämä maisterin opinnäytetyö on vertaileva analyysi neljästä tapauksesta, jotka edustavat teknologisesti augmentoidun rakentamisen ideologioita. Kaksi ensimmäistä ovat 1960-luvulta: taitelija Constant Nieuwenhuysin utopistinen projekti New Babylon sekä arkkitehti Cedric Price Fun Palace, kauaskatseinen aikainen kyberneettinen arkkitehtuuriprojekti. Näitä projekteja vertaillaan kahteen tätä opinnäytetyötä kirjoittaessa rakenteilla olevaan älykaupunkiprojektiin: Masdar Cityyn Abu Dhabissa sekä Songdoon Etelä-Koreassa.

Tämän työn tavoite on paikantaa edellä mainittujen tapausten ideologiset lähtökohdat ja selvittää miten teknologisesti orientoituneet ajatusmallit ovat kehittyneet. Miten taustatoimijat ja suunnittelijat esittävät projektinsa? Millaisia arvoja projektit väittävät edustavansa ja onko arvot mahdollista paikantaa itse suunnitelmista? Asettavatko nykyhetken älykaupunkiprojektit kaupungin elämän ja asukkaat etusijalle vai onko taustalla toisia motivaatioita?

New Babylon oli ympäristö uudenlaiselle nomadiselle kulttuurille. Se koostui loputtomasti varioitavista tiloista joiden tunnelmia ja 'atmosfääriä' oli mahdollista muokata. Fun Palace oli valtava konemainen rakennus, jonka osia kävijät pystyivät järjestelemään uudestaan rakennukseen sisäänrakennettujen nostokurkien avulla. Kumpikaan näistä suunnitelmista ei näyttäisi päivästä toiseen samalta vaan olisi jatkuvassa muutoksen tilassa. Projekteja ei koskaan toteutettu. Ensimmäinen jäi yhden taiteilijan merkittävimmäksi projektiksi jota hän työsti yli vuosikymmenen ajan. Jälkimmäinen eteni rakennuslupahakemuksiin asti ja sen parissa työskenteli vuosien saatossa satoja ihmisiä, mutta rakennustöitä ei koskaan aloitettu.

Masdar City ja Songdo ovat nk. ubiikkikaupunkeja joissa on monia yhtäläisyyksiä. Molemmat kaupungit on rakennettu puhtaalta pöydältä. Kaupunkien pohjaksi rakennetaan älykkäitä utiliteettiverkostoja joihin on sisäänrakennettu digitaaliset seurantajärjestelmät. Molemmat kaupungit väittävät, että tämä mahdollistaa paitsi kaupungin resurssien tehokkaamman käytön ja kontrolloinnin, myös päästöjen minimoinnin ja paremmin toimivan sosiaalisen kaupunkiympäristön.

Tutkimustyö osoittaa, että käsiteltyjen tapausten julki tuotujen ja tuomatta jätettyjen tavoitteiden välillä on eroja. Kaikissa tapauksissa rakennettuun ympäristöön integroitujen teknologioiden uskotaan tuovan mukanaan uudenlaisia vuorovaikutuksen mahdollisuuksia kaupunkilaisten ja kaupungin välille. New Babylonissa ja Fun Palacessa tavoitteena oli luoda ympäristöjä, joissa kansalainen voisi harjoittaa kriittisyyttä ja ennen kaikkea kontrolloida ympäristöään itse. Masdar Cityssa ja Songdossa kontrolli annetaan infrastruktuureille ja niiden operoijille. Samaan aikaan infrastruktuurien luettavuus häivytetään. Urbaanin ympäristön muoto säilyy entisellään ja taustalla toimivat sensorit ja algoritmit toimivat kansalaisten havainnoinnin ulkopuolella.

Nämä kerrostumat infrastruktuurien ja tarkoitusperien kerrostumat, näkyvät ja piilotetut, julkituodut ja sanomatta jätetyt, ovat merkki siitä, että älykaupunkiliikkeen teknologinen optimismi kätkee taakseen muutakin kuin tekemiään lupauksia. Menneiden teknologisten visioiden tarkastelu tarjoaa heijastuspisteen nykyhetken kehityksen arvopohjan tarkasteluun.

Avainsanat älykaupunki, ubiikkikaupunki, kybernetiikka, algoritmit

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1. PROLOGUE

When I first started looking for a thesis subject, I was interested in how digital communication technology and virtual/augmented reality might shape our built environment. Would there be any need for private property or private spaces anymore? Or would there even be a need for spaces at all, could everything just move into the virtual world?

While reading about our current post-digital landscape I repeatedly came face to face with the all-too-physical infrastructures and landscapes in which all our 'non-physical' activities in digital space take place. Data centers, submarine cables and broadband networks hide in the peripheries of both our vision and our experience.

Exploring the infrastructures that serve as the backbone of our increasingly digital lives got me thinking: how do digital infrastructures and communications manifest in our daily life? They take forms of objects, devices, services, interfaces and products that are becoming more and more connected on the global scale. But have we truly internalized what the repercussions of this pervasive connectedness is? These technologies have in a way been around for some time, but they have also developed so quickly that society has not had time to adjust to their existence.

I recall having a discussion with some classmates in 2009. They were astounded that I had Internet connectivity on my cell phone and could not fathom why anybody would want or need that. Fast forward only a few years and smart phones were in almost everybody's hands and most of our civic life is by now either mediated through digital systems or has moved online and into our Internet-enabled devices altogether. At the time of finishing this thesis entire universities, workplaces and other institutions have been forced to move online because of the Coronavirus pandemic. This has brought the ubiquity of wireless and wired connectedness to the forefront at a scale in which most people have never experienced before.

2. INTRODUCTION

This Master's thesis attempts to trace ideologies attached to technologically augmented architecture through the 1960s until present. Technologically oriented architecture and city planning have maintained a technological optimism, a trust in the possibility of new ways of communication and computation. New emerging paradigms have served as backgrounds for grandiose visions of the – often surprisingly near – future, where everything would change for the better, through implementation of the newest innovative apparatus.

These visions have taken different forms at different times. They are dreams of responsive buildings and emancipation through technology. On the other hand, they offer the opportunity to finally 'see' the city for all it is, through relentless monitoring and data gathering. In chapter two of this thesis I will discuss the background of these kinds of ideals and how they can be traced back over the past half century.

In chapter three I will present two contemporaneous projects taking shape mainly in the 1960s which I see as precedents of contemporary smart city initiatives. These projects are New Babylon by artist Constant Nieuwenhuys and Fun Palace by architect Cedric Price. Both of these projects tried to answer questions of life after automated work and life in the modern environment where old power structures and social dynamics were being critically examined. They saw architecture as a key component for facilitating new ways of civic participation.

In chapter four I will present two projects that represent the contemporary smart city ideology: Songdo in South Korea and Masdar City in the United Arab Emirates. Both of these cities have been built from the ground up with the latest urban technologies and for that reason stand as canonical projects of the last decade of smart city development. They promise environmentally conscious environments that also foster productivity and serve as flagships of their respective countries' attractiveness to investment.

After discussing these two pairs of case studies I will make a comparative analysis of their similarities and their differences. Both in the 1960s and in the 2010s there was a sense of a coming technological shift that would change our built environment in a drastic way. Fifty years ago this was thought to free us from stale power structures. A banal, alienated existence of wage labor was to be transformed into more open-minded, free and critical individuals. In recent years, technology has been seen more as tool to put cities under control and scrutiny. Data is being heralded as a way to understand urbanity. The newness and smartness of these new towns provide fertile ground for two of this millenium's powerful economic forces: real estate development and Silicon Valley-spawned digital innovation.

3. CYBERNETIC LIFE

A strong belief in technology – specifically digital technologies – is as emblematic of our time as it was of mid-1900s. Silicon Valley and the global scene of 'tech' dominates the media and the markets. Tech companies grow fast and some of them are now larger than any other company in history. Tech CEOs and founders are prominent in the media, giving opinions on both tax policy[1] and space colonization[2]. Venture capital is always on the lookout for the 'next big thing' and technologists are gaining more attention from public officials and governments.

Many of the products and environments that contemporary tech corporations are building are the latest realization of *cybernetic* ideas from half a century ago. The term itself dates back to the 1940s. Cybernetics is the scientific study of how humans, animals and machines control and communicate with each other.[3] Feedback loops are key to cybernetic systems: action in the systems creates change in its environment and the change is reflected in the system.[4] The goal of this was to create systems that reduce uncertainty and ultimately achieve stability by adapting and adjusting to the information gained in exchange with the outer world.[5]

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1 — Juha-Pekka Raeste, "Suuri veronmaksaja Supercell huolestui: Suomi menettämässä miljoonien edestä verotuloja, jos verotukseen kaavailtu jättiuudistus toteutuu." *Helsingin Sanomat* (2019)

2 — Alex Davies, "Elon Musk: We Need To Leave Earth Or Risk Extinction." *Business Insider* (2013)

3 — Mathematician and philosopher Norbert Wiener gave a name to the field in his book Norbert Wiener, *Cybernetics: Or Control and Communication in the Animal and the Machine* (The MIT Press, 1948), 11.

4 — Ibid., 7.

5 — Mary Louise Lobsinger, "Cybernetic Theory and the Architecture of Performance: Cedric Price's Fun Palace," in *Anxious Modernisms: Experimentation in Postwar Architectural Culture*, ed. Réjean Legault Sarah Williams Goldhagen The MIT Press, 2000), 132.

The contemporary rendition of cybernetics is the tendency to embed technology into every single thing[6], which will allegedly instantly make it 'better'. If we can put a sensor in it and connect it, we'll know more about it and have more control over it. The iterations of this tendency vary in scale from public infrastructure to consumer products. One of the concepts at the forefront of this discussion is the *Internet of Things*, which seeks to include sensing and communication functionality to everyday objects traditionally devoid of them, having washing machines, garage doors and electric toothbrushes communicate with us and more importantly, with each other.[7] The motivations and rationales vary in kind; the ability to monitor and gather data about all manner of activity, previously invisible to outside observers, can on the one hand purportedly be utilized to reduce emissions through increased efficiency, and on the other, to create a whole new category of consumer products with the prefix *smart*.

Architecture has come to the foreground with the vision of so called *smart cities*. They are cities, newly built or retrofitted, that will have an increasing amount of their activities tracked and measured, optimized and calibrated through digital technologies.

The technologies underlying smart cities are being built by many of the biggest players in the game. Technology giants like IBM, Siemens and Cisco, not to mention the ever-present Alphabet – parent company of Google – are involved in building infrastructures on a citywide scale, for instance in our case studies Songdo and Masdar City, where

6 — Benjamin Bratton theorizes in his book *The Stack: On Software and Sovereignity (2016)* the possibility in the Internet Protocol version 6 (IPv6) to have an address for every grain of sand, every human cell etc. and what this could mean.

7 — Friedemann Mattern, Christian Floerkemeier, "From the Internet of Computers to the Internet of Things," *Informatik-Spektrum* 33 (2010).

respectively Cisco[8,9] and Siemens[10] are responsible for most of the cities' infrastructures.

This amount of data gathering and computation will require an enormous amount of equipment. IBM calls these technologies in their Smarter Planet initiative the *"three I's"* : instrumentation, interconnectedness and intelligence. In more distinct terms, one might call them sensors, networks and analytics.[11] Embedding sensory, communication and responsive technologies in the built environment is not a new concept. The term used for this scale of connectivity and computation is *ubiquitous computing*. Ubiquitous means *"existing everywhere at the same time"*.[12] In the context of computing this means an increased prevalence of objects capable of computation and connecting with each other. The term was coined already in the late 1980s by computer scientist Mark Weiser while working as chief technology officer at Xerox PARC (Palo Alto Research Center).[13] Weiser foresaw light switches, thermostats and ovens becoming connected already 30 years ago[14]

Before Weiser's time, in the 1960s and 1970s the architectural field saw the rise of a futuristic and technologically optimistic tendency. Emblematic architectural styles of the era were futuristic and hopeful, sometimes to the point of being fictitious.[15] While some projects, like Buckminster Fuller's designs for new structural solutions such as his geodesic domes

8 — Pete Swabey, "IBM, Cisco and the business of smart cities." *Information Age* (2012)

9 — Greg Lindsay, "Cisco's Big Bet on New Songdo: Creating Cities From Scratch." *Fast Company* (2010)

10 — Federico Cugurullo, "Urban exo-modernisation and the policy context of new eco-city projects: Where Masdar City fails and why," *Urban Studies* 53 (2016).

11 — Swabey, "IBM, Cisco and the business of smart cities."

12 — Merriam-Webster online dictionary

13 — Mark Weiser, Rich Gold, John Seely Brown, "The origins of ubiquitous computing reserach at PARC in the late 1980s." *IBM Systems Journal* Volume 38, Number 4 (1999)

14 — Mark Weiser, "The Computer for the 21st Century." *Scientific American* (1991)

15 — Douglas Murphy, *Last Futures: Nature, Technology and the End of Architecture* (Verso, 2016).

were extremely practical[16], others were purely polemic. The Continous Monument[17] and No-Stop City[18] by the radical Italians Superstudio and Archizoom respectively were never depictions of projects for the physical world, but critical views into the way society was developing. Other projects again were more or less science fiction, like Walking City by Archigram, where they envisioned a nomadic city that would travel on land and sea, never settling long in a single location[19].

Murphy describes a forward-minded and adventurous mindset. The rate of societal and technological change felt so rapid that the whole society was believed to reform. There was faith that emerging issues such as urban congestion, resource scarcity and automation could and would be solved, and architecture would be one of the foundational disciplines in this literal and metaphorical world-building.

A citizen of a leisure society, freed from the drudgery of work through automation, liberated from the taboos and demands of society is a central character in this worldview: *"the image of the nomadic subject moving freely through a city constantly fine-tuned to their requirements was one that haunted the dreams of the age".*[20] These impressions are also notably present in the case studies I have selected from this time period: New Babylon and the Fun Palace.

A key starting point here is that of the *one-dimensional man*. The world according to this philosophical concept is one where modern administration would have created a society where citizens would be so comfortable in their daily lives that their distractedness would negate the possibility of change or any negativity, channeling their so-called freedoms into harmless distraction and conformity.[21]

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16 — Ibid., 116.
17 — Ibid., 152.
18 — Ibid., 150.
19 — Ibid., 113.
20 — Ibid., 2.
21 — Herbert Marcuse in Ibid., 106.

Fig 1: Buckminster Fuller demonstrating the structural qualities of a geodesic dome with students from Black Mountain College, North Carolina, 1949

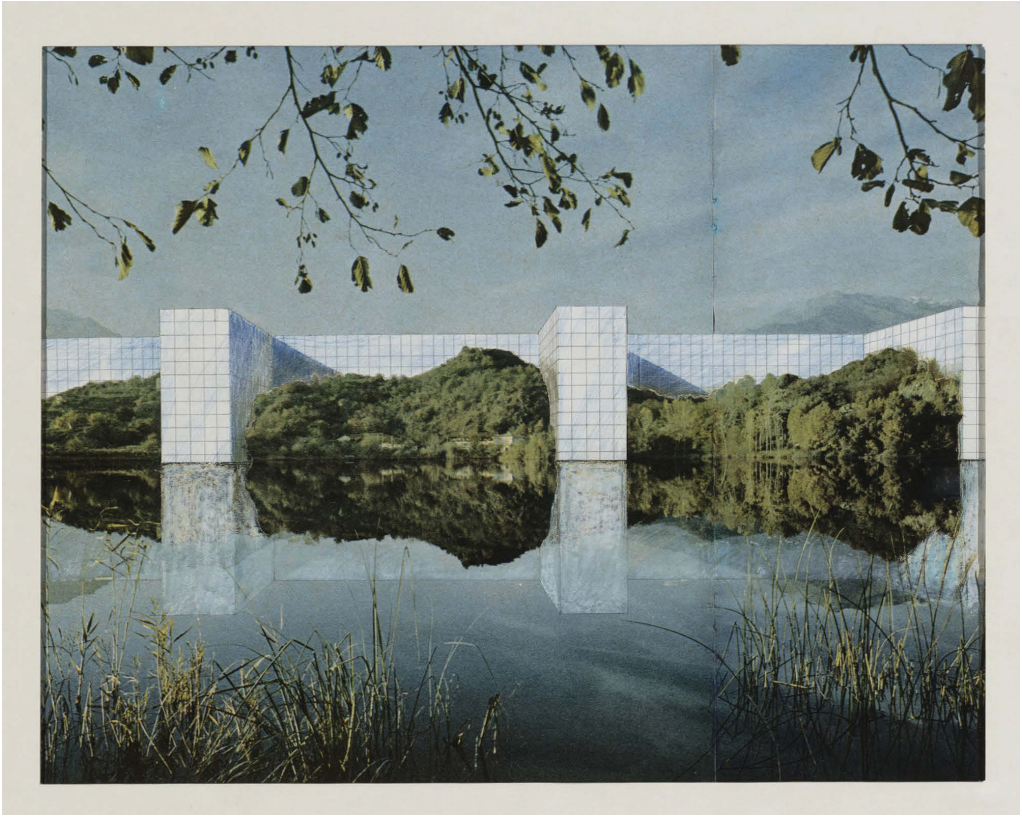

Fig 2: The Continuous Monument by Superstudio was a theoretical structure, spanning the whole planet. The project was not a prediction of the future, but an *"unbuildable"* critical project.

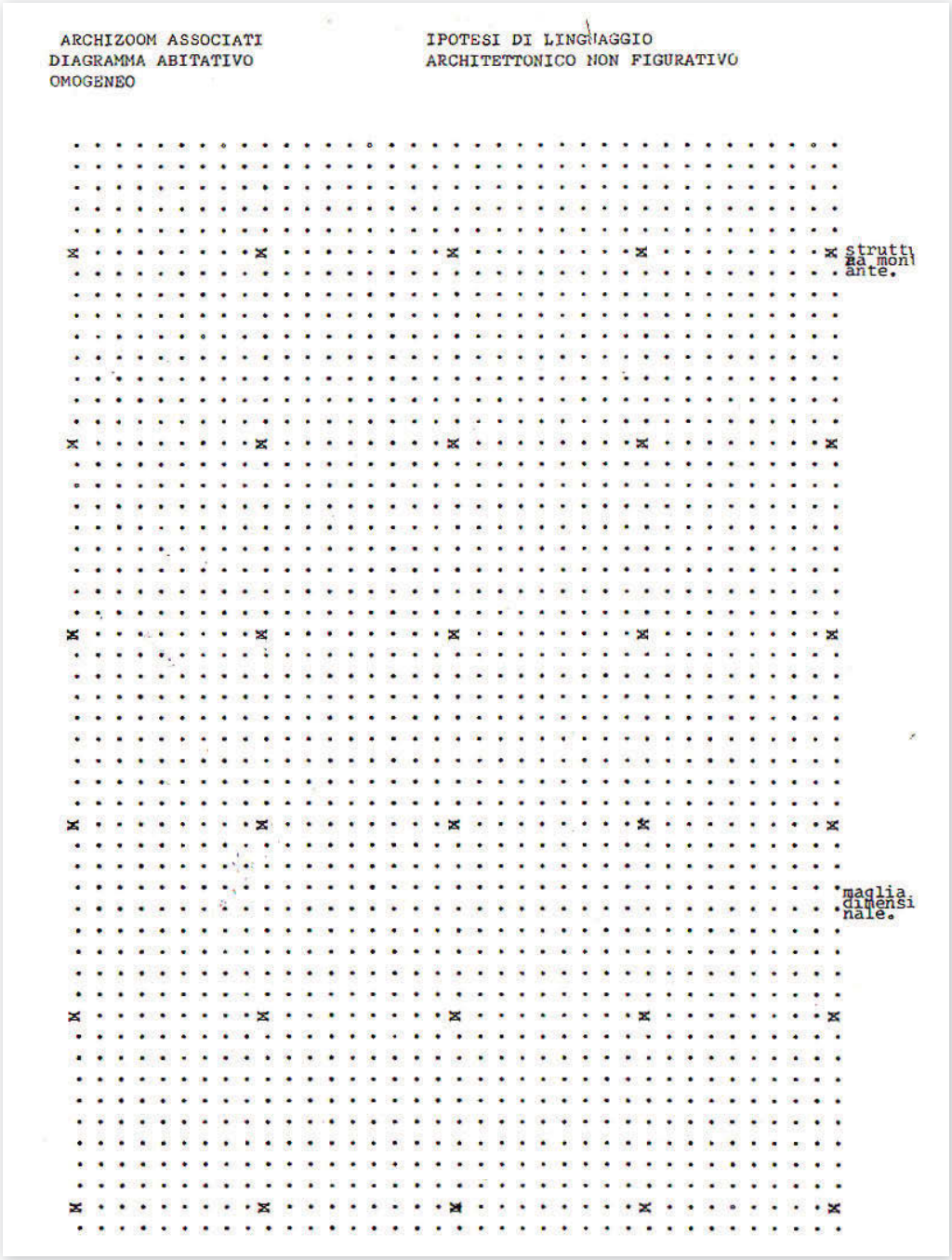

Fig 3: Early floor plans for No-Stop City were produced on a typewriter.

Fig 4: Walking City by Archigram anticipated that the increasingly fast technological development of society would lead to nomadic structures that would plug into utilities where ever they went and sharing cultures and information globally.

Both contemporary ideas of technologically enhanced cities and utopian cybernetic projects from half a century ago tackle these issues, but they do so from different sides of the story. As a result of too much comfort and administration the one-dimensional man was perceived as a threat to the future of the society, stripping the citizen of their agency. Contemporary discourses on the other hand foreground comfort and efficiency, precisely what was considered harmful in the discourse of the 1960s. They risk turning the citizen into a *user* instead.

In between the first steps of cybernetic architecture in the 1960s and the smart cities of today there was a period that spawned the concept of cyberspace and virtual reality, or "*a world inside the computer*".[22] The cyberspace craze of the 1990s even saw an idea of a completely new profession popping up, that of the *cyberspace architect,* who would be tasked with visualizing the *"intrinsically nonphysical and giving inhabitable visible form to society's most intricate abstractions"*, with programming the digital world as equivalent to constructing the physical.[23]

The arrival of the digital world understandably created a revolutionary atmosphere, as it quickly started affecting all aspects of how society worked and functioned. It was credible to project a future where digitality would not only reshape our environment but eventually overtake it.

Many of these early Silicon Valley-based views of digital futures of the 1990s were actually produced by the same counterculturalists – partially inspired by the architectures depicted in *Last Futures* – who in the 1960s and 1970s left cities to create alternative communities in the outskirts of the USA. Most of these communities included alternative futuristic living structures, of which variations on Buckminster Fuller's geodesic domes became the most emblematic. They eventually returned from their experimental communities and

22 — Weiser, "The Computer for the 21st Century."

23 — Michael Benedikt, "Introduction," in *Cyberspace: First Steps*, ed. Michael Benedikt The MIT Press, 1991), 12.

experimental architectures and put their efforts into the emerging computer scene.[24]

Since then, it seems that the actual physical world has made a return and now we are not discussing our potential experiences *beyond* this world or connecting ourselves to the digital worlds inside computers, but are injecting and embedding the digital world into the physical. The Internet of things, a buzzword of our time if there ever was one, makes this blatantly clear: if the Internet is something immaterial, what if we combine with actual 'things'?

These technologies are now deeply entangled in our urban fabrics and our everyday lives. The relatively recent platform economies inserted themselves into marketplaces where Internet-enabled digital technology was absent, like ordering takeout, getting a cab, watching a movie, listening to music or buying pretty much any product you could ever need.[25] Truly ubiquitous connectivity and computation is created via a relative supercomputer in everybody's pocket, and Internet-enabled devices proliferate in our homes, offices and streets by the day.

It is this return of the physical aspect of the digital technologies that I wish to look into. I have chosen as my objects of analysis four polemical projects, two from the early days of cybernetic architecture and two from our current time. I will present one artist's utopian city New Babylon, and one of the first proposed cybernetic public building projects, the Fun Palace. Both of these projects were never realized. After these I will present Masdar City and Songdo, two smart cities under construction at the time of writing this thesis, in the next chapter.

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24 — Murphy, *Last Futures: Nature, Technology and the End of Architecture*, 211.

25 — All of these activities are nowadays predominantly mediated by different digital platforms, respectively Wolt, Uber, Netflix, Spotify, Amazon.

4. HISTORIES OF THE FUTURE

This chapter presents my first two objects of analysis: New Babylon by artist Constant Nieuwenhuys (1959—1974) and the Fun Palace by architect Cedric Price (1959—1974). Both projects were unrealised and regarded as utopian and controversial.

The projects share many key sensibilities. They both aim to use technology to give their inhabitants or visitors a totally new kind of experience and control over their environments. Opening up the inhabitants' mind to critical thinking and giving them freedom of choice over their own actions and the environments that were needed to facilitate them was central to both.

In the 1960s the concept of the Internet was in its primordial stages[26] and the word 'smart' would not have applied to buildings or cities in the way it does today, but these two projects predicted a major possibility in technology to enhance human existence like never before.

26 — The Internet's precursor, ARPANET, would carry its first successful transmission in 1969. Chris Sutton, "Internet Began 35 Years Ago at UCLA with First Message Ever Sent Between Two Computers." *News, UCLA.edu* (2004)

4.1. NEW BABYLON – AN ARTIST'S UTOPIA

4.1.1. What, When & Who

Constant Nieuwenhuys (1920—2005, later referred to by his *nom de plume* Constant) was a Dutch artist turned self-educated architect. Originally a painter, in 1953 he turned to working with spaces and architecture[27]. He slowly started formulating a new kind of structure to encompass a new kind of life after automation had done away with all labor, when *"leisure time will be the only time"*[28]. This leisure time would generate a return to the nomadic human, always moving within a new world with no borders and limits.[29]

In 1959 he presented a large model entitled *Ambiance d'une ville future* (Ambience of a Future City) at the Stedelijk Museum in Amsterdam, which would go on to become one of the centerpieces of a larger project continuing for over 15 years until the early 1970s.

4.1.2. Description

This project would later be named New Babylon. It was to be a city, suspended high above the ground on massive columns. Traffic would run on the ground level and fully automated factories would be buried underground.[30] The city would spread across the landscape as an ever-growing network.[31] Constant refused to engage with the existing built environment, instead depicting the structure as – literally and figuratively – rising above the decaying old cities that went before it.[32]

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27 — Mark Wigley, *Constant's New Babylon: the hyper-architecture of desire* (010 Publishers, 1998), 12.

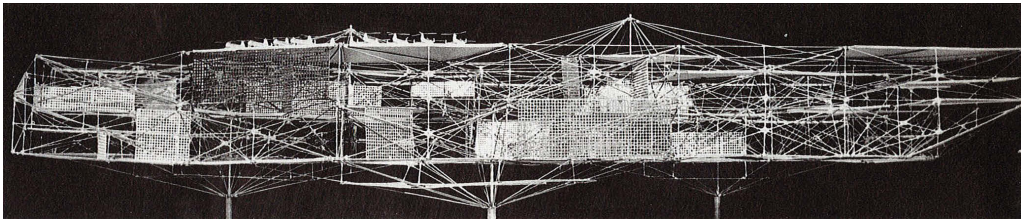
28 — Ibid., 9.

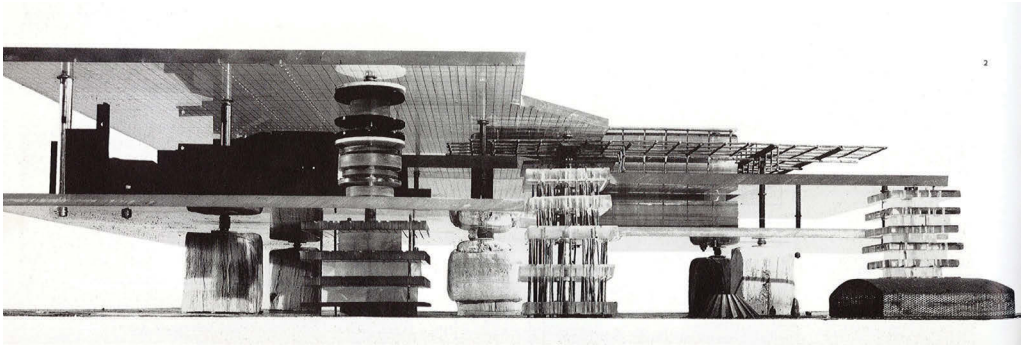
29 — Thomas McDonough, "Fluid Spaces: Constant and the Situationist Critique of Architecture," in *The Activist Drawing - Retracing Situationist Architectures from Constant's New Babylon to Beyond*, ed. Catherine de Zegher, Mark Wigley The MIT Press, 2001), 93.

30 — Wigley, *Constant's New Babylon: the hyper-architecture of desire*, 9.

31 — Ibid., 13.

32 — McDonough, "Fluid Spaces: Constant and the Situationist Critique of Architecture," 99.





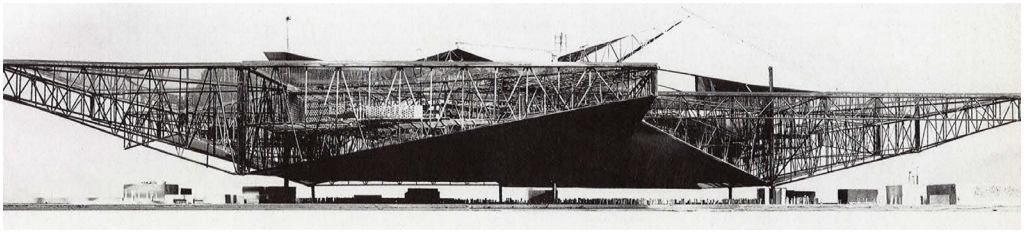


Fig 5: "Sector Construction"

Fig 6: "Red sector"

Fig 7: "Large Yellow sector"

Inside the structure one would find a basic structure of large empty planes, minimally defined and divided, so as to permit its ever-changing population to form their own surroundings.[33] Everything in the physical environment is reconfigurable, from floors to stairs, from partitions to bridges. The result is an ever-changing labyrinthine construction[34] where nothing is ever permanent, allowing for the "*perpetual creation and recreation of the milieu*".[35]

The seemingly endless interior space is equipped with *"ambience-creating resources"*, meaning residents are given total control over their environment, soundscape, acoustics, ventilation texture, temperature, lighting, moisture and so forth.

New Babylon was presented in art exhibitions and political journals through a myriad of sculptural constructions, models, drawings, i.e. with techniques often used in traditional architectural representation. This method of presenting the work blurred the division between art and architecture.

Even though Constant was not a trained architect, co-opting the representational methods of architects gave his ideas a sense of realism or achievability. Architectural drawings carry more weight than images and sculptures belonging to the traditional artist's media, as they are considered not only works in and of themselves, but are inevitably read as representations of an existing or possible reality.

4.1.3. Goals

Constant describes that the modern city was a "*thinly disguised mechanism for extracting productivity out of its inhabitants, a huge machine that destroys the very life it is meant to foster*".[36] The emerging situation at the turn of the 1960s

33 — Ibid., 93.

34 — Wigley, *Constant's New Babylon: the hyper-architecture of desire*, 10.

35 — McDonough, "Fluid Spaces: Constant and the Situationist Critique of Architecture," 94.

36 — Wigley, *Constant's New Babylon: the hyper-architecture of desire*, 9.

Fig 8: *"Symbolic representation of New Babylon"* spreading accross the landscape consisting of cut-out maps of existing cities

was that of a society still stuck in its old ways of production and labor, social reproduction and hierarchies. Constant felt that a new kind of city was needed for humankind to be liberated from old structures.

He predicted that urban expansion would continue as it had until then, until a single urban structure would occupy the whole surface of the earth. In an attempt to envision a less exploitative future, Constant suggested that we abandon *"static constructions of architects and town planners"*. The old *"ground-based"* cities would slowly be replaced by this new structure, on a planetary scale.[37]

In Constant's view, nature had already been replaced by a *new nature*: technology. He called for a creative transformation of technology that would support a new culture and a new kind of society.[38] This new culture is one where desire and space are intimately bonded.[39] Where inhabitants of New Babylon would learn to take over the shaping of their spaces. Efficiency of mobility and productivity was abandoned. Instead, getting lost and making detours was prioritized:[40] *"high technology is displaced from work to play"*.[41] Instead of wage labor, the pleasure of living, shaping and interacting with one's environment would become the dominant activity.[42]

This never-ending practice of engaging with one's environment is called *unitary urbanism*, which was created in close collaboration with Situationists like Guy Debord. Constant was a founding member of the Situationists International.[43] Unitary urbanism was based on the Situationists' concept of dérive, a roaming of the city that undermines its structure by focusing on atmospheres and situations beyond the control of a planning authority

37 — Ibid., 13.
38 — Ibid., 9.
39 — Ibid.
40 — Ibid., 14.
41 — Ibid., 27.
42 — Ibid., 9.
43 — Ibid., 12.

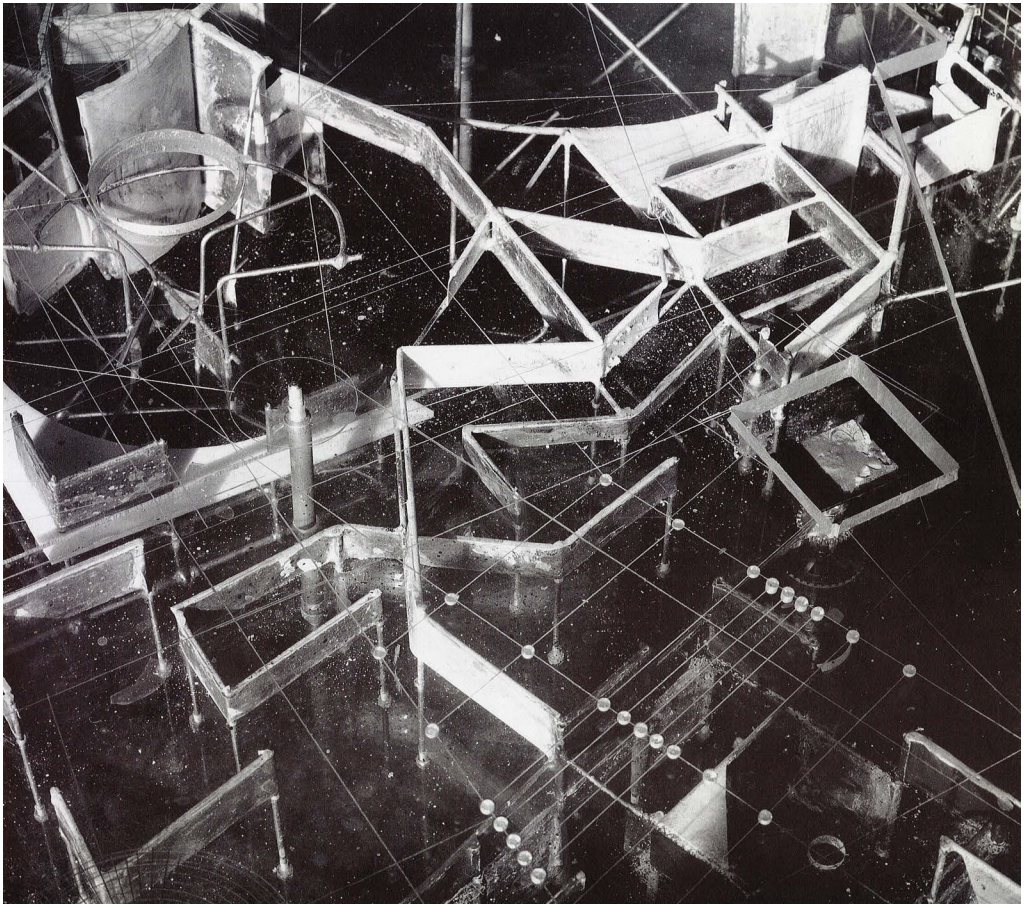


Fig 9: *"Yellow sector"*, a view into the interior of New Babylon.

or economic force. The visible, planned order of the city concealed a psychological order that the situationists claimed could be *"revolutionary if exploited"*.[44]

Even though New Babylon was originally developed in close collaboration with Debord and the Situationist International (Debord actually coined the name New Babylon, originally the project was called *Dériville*[45]), it still remained Constant's brainchild. This makes it notably different from the topic of our next chapter, the Fun Palace, which not only came close to realization, but was a collaboration of hundreds of people and not only a magnum opus of its protagonist, architect Cedric Price.

44 — Ibid.
45 — Ibid., 16.

4.2. FUN PALACE – CYBERNETIC ENVIRONMENT

4.2.1. What, When & Who

The Fun Palace was a project for a public building first initiated by theater director Joan Littlewood (1914—2002). Littlewood was known for her work in experimental and political theater and rejecting standardized forms of the art. The Fun Palace was to be *a "laboratory of pleasure, providing room for many kinds of action."*[46] Faced with the increasing amount of leisure time in addition to daily labor, Littlewood wanted to create a modern day agora, a public space for meetings and debates, a center of social and political life.[47] The idea was to invigorate people, to provide a space for people to engage with each other and their surroundings:

> *"Men and women from factories, shops, and offices, bored with their daily routine, will be able to re-enact incidents from their own experience in burlesque and mime and gossip, so that they no longer accept passively whatever happens to them but wake to a critical awareness of reality."*[48]

Architect Cedric Price (1934—2003) was a well-known provocateur in the architectural field of the United Kingdom. He has been described as an iconoclast and an early enthusiast of the possibilities of computing and communications technologies within architecture.[49] Price joined the Fun Palace project after a chance encounter with Littlewood. In Littlewood's mind, architecture was not the primary focus of the project, and she did not give Price a design brief, but asked him to consider what (if anything)

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46 — Joan Littlewood, "Non Program: A Laboratory of Fun," in *Cedric Price Works 1952-2003: A Forward-minded Retrospective: Articles & Talks*, ed. Samantha Hardingham AA Publications, 2016), 93.

47 — Ibid.

48 — Ibid.

49 — Rowan Wilken, "Calculated Uncertainty: Computers, Chance Encounters, and 'Community' in the Work fo Cedric Price," *Transformations* Issue No. 14 (2007).

Fig 10: A rare image of the Fun Palace in a potential real life context.

architecture could bring to this idea.[50] Price saw an opportunity to create an architecture where visitors could influence their surroundings in a completely new way.

The project, although never realized, was not strictly a paper architecture project like so many of its kindred spirited projects from the 1960s–1970s. Several actual sites were considered for the building, and planning applications for sites in London were submitted in 1963 and 1964[51]. Hundreds of people eventually ended up being involved in the project, including politicians, actors, architecture critics and researchers. A separate Fun Palace Cybernetic Committee was set up, consisting of sociologists, psychologists, artists, statisticians etc., with the cybernetician Gordon Pask as its chairman.[52] The committee was in charge of designing the Palace's constantly changing functions and interfaces and the cybernetic systems that would make all of them possible.

4.2.2. Description

The sheer size of the project would have been remarkable. The complex was to be over 35 meters high, 114 meters wide and 260 meters long. Besides the building's core structural and service elements, no part of it would be fixed. Staircases, inflatable or reinforced plastic enclosures, walkways and larger enclosures could be replaced and relocated at will, making the structure different from day to day, even from hour to hour.[53]

The enormous scale is even more surprising considering the intended lifespan of the building: ten years.[54] Ever at odds with the architectural canon, Price rejected the idea of architecture as relatively stable and enduring, of architecture as shelter or as a permanent signifier of social

50 — Samantha Hardingham, *Cedric Price Works 1952–2003: A Forward-Minded Retrospective* (Architectural Association, Canadian Center for Architecture, 2016), 47.

51 — Ibid., 65-66.

52 — Ibid., 56.

53 — Ibid., 55.

54 — Cedric Price, "Fun Palace," in *Cedric Price Works 1952-2003: A Forward-Minded Retrospective: Articles & Talks*, ed. Samantha Hardingham AA Publications, 1965), 30.

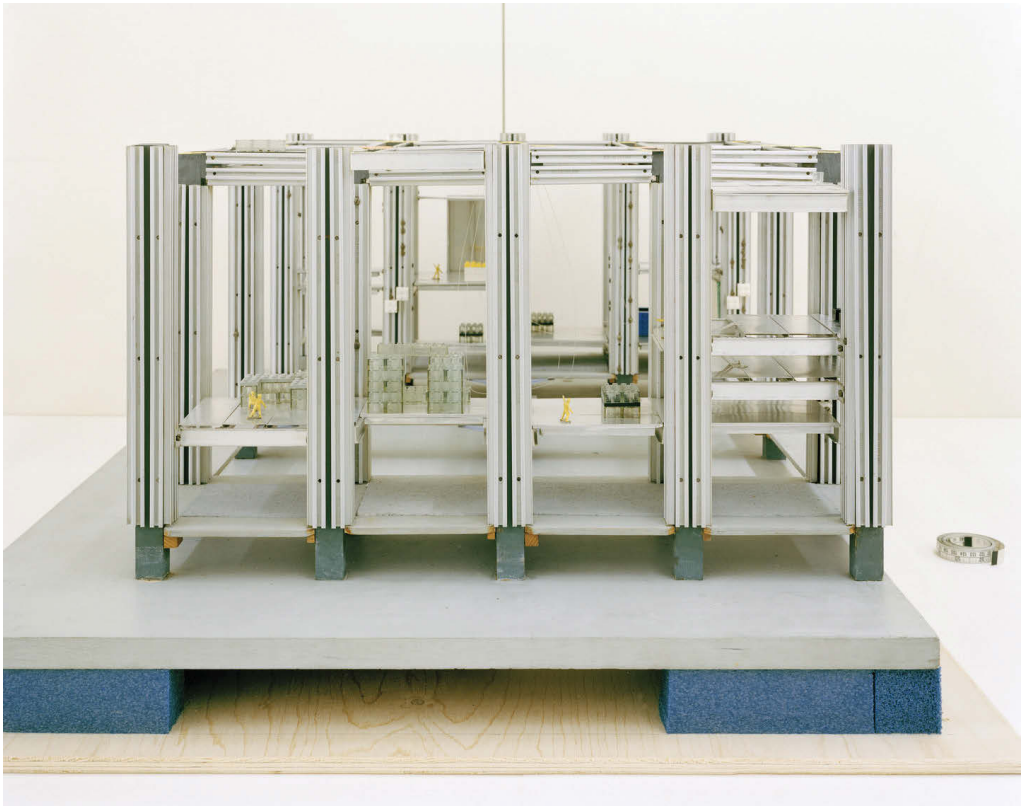

Fig 11: A model of the Fun Palace from 1964, eerily reminiscent of a contemporary server rack.

values.[55] One of the key points of the whole project was that it should provide for unexpected and surprising uses. Price was adamant that architects (or anyone else for that matter) could not foresee the future, so any building of such complexity designed to last for a longer period of time would inevitably become obsolescent.[56]

To make fast construction and constant modification possible, details and building products were sourced from catalogues outside the regular sphere of architectural design: from aeroplane manufacturing and seaport logistics.[57] The Fun Palace would also be equipped with its own sewage purification plant and would even be capable of continually cleansing itself with recycled river water.[58]

4.2.3. Goals

Freedom of choice, movement and action was central to the Palace. *"Nothing is obligatory, anything goes"*[59], wrote Littlewood. Even though forward-thinking in its technological aspects, the aspiration of the project were people and their actions. Price described using a *"tight, carefully designed technology to achieve a loose, free-will social patterning."*[60] Spread throughout the structure, there would be screens that would both show what was going on in the complex, but also in other parts of London or the world. Local and World news would also be displayed.[61]

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55 — Lobsinger, "Cybernetic Theory and the Architecture of Performance: Cedric Price's Fun Palace," 120.

56 — Cedric Price, "Fun Palace," in *Cedric Price Works 1952-2003: A Forward-Minded Retrospective: Articles & Talks*, ed. Samantha Hardingham AA Publications, 1964), 21.

57 — Hardingham, *Cedric Price Works 1952–2003: A Forward-Minded Retrospective*, 55.

58 — Lobsinger, "Cybernetic Theory and the Architecture of Performance: Cedric Price's Fun Palace," 120.

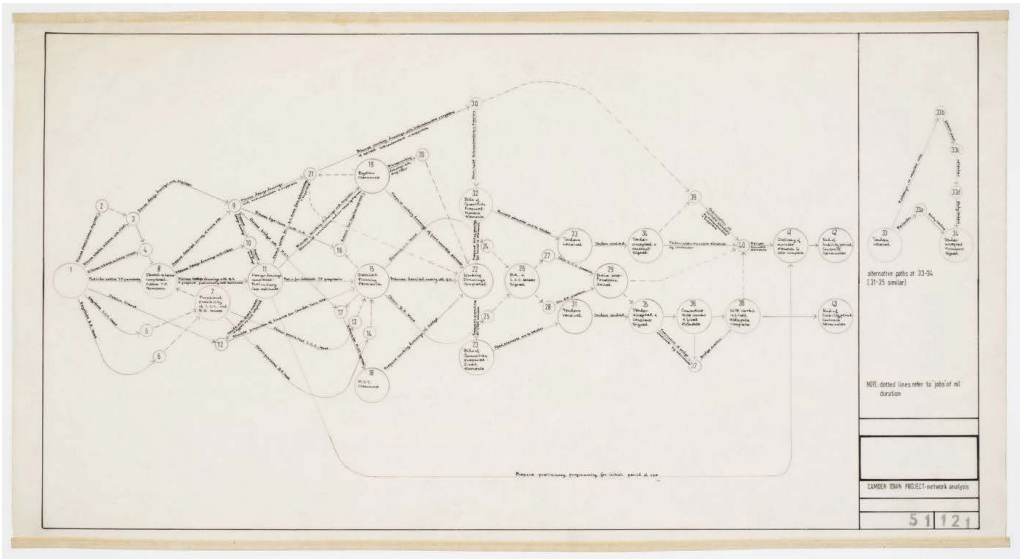
59 — Littlewood, "Non Program: A Laboratory of Fun," 93.

60 — Cedric Price, "Technology is the Answer, but what was the Question?," in *Cedric Price Works 1952-2003: A Forward-Minded Retrospective: Articles & Talks*, ed. Samantha Hardingham AA Publications, 1979), 327.

61 — Littlewood, "Non Program: A Laboratory of Fun," 94.

Since the project was never built and hence no photographs exist, it might be hard to imagine what it actually would have been like inside the Fun Palace. How would one have actually used it, changed its layouts and how would one have found one's way about it when it was changing from day to day. Price's representation of the project focuses more on diagrams and spreadsheets than conventional architectural imagery. Architectural Design had this to say about it in 1970: *"Standard forms, elevations and perspectives mean little in terms of Price's work"*. They point out that unlike many of his contemporaries Price is *"consciously anti-style – sometimes even at the expense of comprehensibility."*[62]

62 — Cedric Price, "Cedric Price Supplements," in *Cedric Price Works 1952-2003: A Forward-Minded Retrospective: Articles & Talks*, ed. Samantha Hardingham AA Publications, 1970), 145.



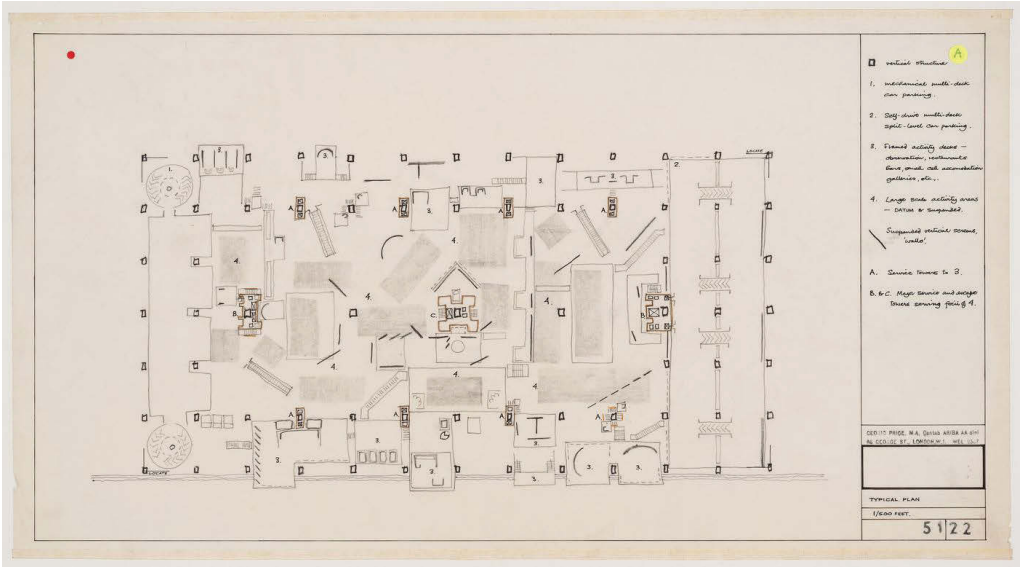


Fig 12: Most of the material produced for the Fun Palace projects are different kinds of diagrams instead of traditional architectural drawings

Fig 13: Even floor plans take on a diagrammatic style, in line with the fact that most of the buildings structures would change from day to day.

5. UBIQUITOUS CITIES OF TODAY

The prescient projects presented in the previous chapter helped build the foundation for projects to come after the turn of the millennium. Sensor-laden environments and digitally controlled buildings were adventurous and hard to imagine 50 years ago, while now they are becoming more and more commonplace.

Masdar City and Songdo are brand new cities. They are not retrofits of established urban centers but built out of the desert and out of the sea, respectively. Both are still in the process of being completed at the time of writing this thesis. They flagship projects of their respective homelands, representing pinnacles of Asian and Middle Eastern city building from the past decades, where building cities out of thin air has become commonplace.[63]

While both are also often described as *eco-cities*[64], their use of – and belief in – technology as a driving force of progress and sustainability make them of interest here. These cities strive to be the rising stars of global smart cities and as such supposedly provide a glimpse into a future where every city in the world might be headed.

63 — Antionio Voce, Nick Van Mead, "Cities from scratch." (2019)

64 — Federico Cugurullo, "How to Build a Sandcastle: An Analysis of the Genesis and Development of Masdar City," *Journal of Urban Technology* 20 (2013)., Sofia T. Shwayri, "A Model Korean Ubiquitous Eco-City? The Politicsof Making Songdo," *Journal of Urban Technology* 20 (2013).

5.1. MASDAR – ABU DHABI'S FLAGSHIP

5.1.1. What, When & Who

Masdar City, in the United Arab Emirates (UAE), is an example of a city that is being built 'smart' to begin with. Initiated in 2006, its master plan is designed by superstar architect Norman Foster, and it is being erected in the middle of the Abu Dhabi desert.[65] It is part of Abu Dhabi's Vision 2030 plan to start diversifying the economy in expectation of a future where the oil supply is going to be exhausted.[66] This inevitably means that the country is not only going to need cities that run on more ecological and lasting energy sources, but other drivers for their economies as well. [67]

The Abu Dhabi emirate controls 8% of the world's oil supply[68] and has one of the highest GDPs per capita in the world.[69] Masdar itself is a state-run company that started as several units including an investment unit, renewable energy technology development and even an independent research university. The most publicly visible product of the company has been Masdar City.[70]

Having a name-brand designer design an entire city from start to finish with the latest integrated technological innovations is meant to attract companies, universities and professionals from all over the world. Masdar City was going to be the world's first zero carbon city and home

65 — Richard Sennett, "Building and Dwelling," (2018), 160.

66 — Cugurullo, "Urban exo-modernisation and the policy context of new eco-city projects: Where Masdar City fails and why."

67 — Nicolai Ouroussoff, "In Arabian Desert, a Sustainable City Rises." *The New York Times* (2010)

68 — Bryan Walsh, "Masdar City: The World's Greenest City?" *TIME* (2011)

69 — Cugurullo, "How to Build a Sandcastle: An Analysis of the Genesis and Development of Masdar City."

70 — Steven Griffiths, "Rethinking the future low-carbon city: Carbon neutrality, green design, and sustainability tensions in the making of Masdar City," *Energy Research & Social Science* 62 (2020).

Fig 14: Street view of Masdar City

to sustainability research and clean tech companies.[71] Masdar itself would not be the one implementing the zero carbon technologies but would rely on an incentive model to fill its infrastructure with the latest sustainable technology.

Many companies such as General Electric and Siemens arrived, with Siemens building up the city's smart grid of roof-mounted solar panels, sensors, optical fibres and automation systems.[72]

5.1.2. Description

Masdar City is designed as a perfect square, raised on a seven-meter high base to capture desert breezes. Driverless cars – Personal Rapid Transport – navigate silently in the tunnels beneath the city's pedestrian streets.[73] Every function of the city has its predestined location and a building dedicated to that function. Foster's team looked into building traditions and techniques of the Middle East to see how these communities have dealt with their surrounding climate in the past.[74]

Here, form truly follows function, as every possible action in the city is preconceived and precalculated. It paints a picture of a city where everything is compartmentalized and thought of beforehand.[75] Traffic is secluded underneath the city, solar energy fields, waste incineration and water treatment plants are located outside the city.[76] A singularly modernist plan if there ever was one, where the century-old dictum of separating functions is implemented without fail.

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71 — Walsh, "Masdar City: The World's Greenest City?"

72 — Cugurullo, "Urban exo-modernisation and the policy context of new eco-city projects: Where Masdar City fails and why."

73 — Ouroussoff, "In Arabian Desert, a Sustainable City Rises."

74 — Ibid.

75 — Richard Sennett, "The Stupefying Smart City." *Open Transcripts* (2012)

76 — Ouroussoff, "In Arabian Desert, a Sustainable City Rises."

Fig 15: A rendered aerial view of the planned city, bringing to mind a circuit board.

The reasoning behind building a wholly new city instead of retrofitting an old one is precisely why it is possible to build the large-scale technological installations, smart resource management and smart grids.[77,78]

The City does include some more traditionally smart solutions for nudging its residents towards resource-efficiency and low consumption. Elevators from the sublevel are tucked away to encourage the use of stairs. On the street level one can only get around by walking. This is a matter of sustainability but also of public health, since obesity has become a significant issue in parts of the Arab world where most people drive to avoid the heat.[79] The streets are narrow and shaded, providing cooler climates for pedestrians. Having an overall cooler climate within the city helps reduce the need for air conditioning, whose liberal use is one of the reasons that that Abu Dhabi has one has the largest per capita carbon footprint in the world.[80]

5.1.3. Goals

The reality of this flagship project is still far away from its intended vision. The city is projected to have 50 000 residents once it is completed, which was originally set to happen in 2016.[81] But by then, eight years after beginning construction, only 300 people lived on site. By the time of writing this thesis in 2020, the number of residents is still only around 1300.[82] The construction of the city is now set to continue as long as the end of this decade.[83]

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77 — Cugurullo, "How to Build a Sandcastle: An Analysis of the Genesis and Development of Masdar City."

78 — Cugurullo, "Urban exo-modernisation and the policy context of new eco-city projects: Where Masdar City fails and why."

79 — Ouroussoff, "In Arabian Desert, a Sustainable City Rises."

80 — Walsh, "Masdar City: The World's Greenest City?"

81 — Christopher Stanton, "Masdar City completion pushed back, but total cost falls." *The National* (2010)

82 — Masdar.ae, "Frequently Asked Questions." *Masdar* (2020)

83 — Anthony Flint, "What Abu Dhabi's City of the Future Looks Like Now." *Citylab* (2020)

Fig 16: Masdar will rarely present this viewpoint of their flagship project. The image shows what had been built of the City in 2015.

The city's carbon zero aim has also not been met.[84] Citizens are used to having air conditioned room at temperatures as low as 15 degrees Celsius. The way to deal with this is to use the city's monitoring system to *"name and shame"* citizens not living up to the city's potential.[85] One wonders whether trying to build a low carbon city in an environment such as the UAE, where enormous amounts of energy go to desalienating sea water and creating hermetically sealed cool living environments will ever be feasible, even with the smartest possible solutions.

84 — Walsh, "Masdar City: The World's Greenest City?"
85 — Ibid.

5.2. SONGDO – WORLD'S GREENEST AND SMARTEST

5.2.1. What, When & Who

In 2004, South Korea started to work on a new city called Songdo, or more precisely, *Songdo International Business District*. The project is publicly funded as part of the country's post-2008-recession stimulus package aimed specifically at infrastructure, most of which is earmarked for green and sustainable investments. It would become the largest private real-estate development in history with a cost of $35 billion[86], developed largely by the US-based real estate company Gale International[87] with compatriot architecture firm Kohn Pederson Fox Associates devising the master plan.[88] The city is located 60 km outside South Korea's capital Seoul.

5.2.2. Description

Like Masdar City, Songdo has been built from the ground up, or rather from sea up. The city is built on six square kilometers of landfill reclaimed from the Yellow Sea[89] and will total over 30 million square meters of space for a population of 75 000, with an additional 300 000 commuters and business travelers.[90]

The form of the city takes its inspiration from the West, with "*the wide boulevards of Paris, a 100-acre Central Park reminiscent of New York City, a system of pocket parks similar to those in Savannah, a modern canal system inspired by Venice*".[91] Project heads from Kohn Pedersen Fox architects based their design concept on the idea to imitate the gradual evolution of a city, by building one from the ground up with a collection of diverse architectural

86 — Anthony M. Townsend, *Smart Cities: Big Data, Civic Hackers and the Quest for a New Utopia* (W. W. Norton & Company, 2013), 25.
87 — Rita Lobo, "Could Songdo be the world's smartest city?" *World Finance* (2014)
88 — Shwayri, "A Model Korean Ubiquitous Eco-City? The Politicsof Making Songdo."
89 — Townsend, *Smart Cities: Big Data, Civic Hackers and the Quest for a New Utopia*, 23.
90 — Shwayri, "A Model Korean Ubiquitous Eco-City? The Politicsof Making Songdo."
91 — Ibid.

Fig 17: A pavilion in Songdo's Central Park, which was inspired by its namesake in New York.

archetypes.[92] The longer history of the area as a hub for commerce and diverse cultures, dating back to the 1800s, has been intentionally overlooked and replaced by a "*history that does not exist*", instead of one forming over a historical process stretching over decades. This reflects the intentions behind the project to build a specifically "*non-Korean*" city, which would include foreign-only schools and medical services.[93]

Songdo is the world's largest experiment in urban automation. Its sreets, electrical grids, water and waste systems are laid with millions of sensors that control everything from turning off street lights in blocks where streets are empty to tracking RFID tags of passing vehicles, creating a real time map of traffic and movement patterns.[94] These installations are being carried out by Cisco, one of the world's largest suppliers of Internet traffic infrastructure such as routers and switches, who have in the past decade made a significant turn towards building underlying infrastructures of smart cities.[95] According to Cisco's executive vice president, they want to create an urban operating system that will not only streamline traffic, heating and electricity use but eventually expand to healthcare and education as well.[96]

Songdo has been conceived as a testbed for RFID-enabled ubiquitous computing. Citizens use a small device dubbed the *u-chip* – the *u* originally referring to the word *ubiquitous* but conveniently also evoking the word *you* – to register when they are entering or leaving a building, or the subway. This is a chip that can be embedded in almost anything, an id badge or a public transit card.[97]

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92 — Wong Dong-hee, "A city, from scratch." *Korea JoongAng Daily* (2020)
93 — Shwayri, "A Model Korean Ubiquitous Eco-City? The Politicsof Making Songdo."
94 — Townsend, *Smart Cities: Big Data, Civic Hackers and the Quest for a New Utopia*, 24.
95 — Swabey, "IBM, Cisco and the business of smart cities."
96 — Lindsay, "Cisco's Big Bet on New Songdo: Creating Cities From Scratch."
97 — Townsend, *Smart Cities: Big Data, Civic Hackers and the Quest for a New Utopia*, 23.

Fig 18: Songdo at twilight.

5.2.3. Goals

One of the stated main goals of these technologies is to drive efficiency and eventually cut greenhouse gas emissions by two-thirds.[98] Songdo is being touted as one of the world's greenest cities. Still, what is worth mentioning is that its construction required a massive landfill operation, displacing the ecologically critical coastal wetland nesting areas of shore birds.[99]

The one thing the city, like Masdar City, is lacking are residents. Despite attempts to lure both Koreans and foreigners to move in less than 20% of the commercial space has been occupied.[100] Planned as it is as one enormous building project, the streetscape has not really been considered. Streets are essentially public spaces, so their direct value as real estate can be questionable. This evidently reflects the values that rise from having a whole city built by a private real estate company. No clients are going to purchase premises on the streets and nobody is going to pay rent for them.

98 — Ibid.

99 — Shwayri, "A Model Korean Ubiquitous Eco-City? The Politicsof Making Songdo."

100 — Lobo, "Could Songdo be the world's smartest city?"

Fig 19: Street view of Songdo, showing the Northeast Asia Trade Tower on the right.

6. FOR THE DUMB CITY

What do the advocates of ubiquitous cities mean by the word 'smart'? Does this imply that cities throughout thousands of years of history until this point have been 'dumb'? The word has an admittedly positive ring to it. Who wouldn't want to be smart?

Beneath the surface – quite literally, in the case of fiber optic cables and utility networks – these cities contain a vast array of agendas and even unforeseen consequences for the societies they are building for. While the dominant message is one of progress and efficiency, there are also other motives at play. Those who are tasked with building all of these infrastructures and implementing them into everyday life stand to gain power over cities. A single actor might have the possibility to have a hand in first envisioning the needs of a city, then building its underlying infrastructure and finally providing the services that run it.

These technologies disappear into the everyday experience by design, under the auspices of 'user-friendliness', making it easy for citizens to use them but hard to actually engage with them. Powerful computing technologies are quickly becoming as commonplace and ambient as traditional utilities like water or electricity. How often do you think about where the water in your tap comes from and how it gets there?

6.1. DIFFERING AGENDAS

New Babylon, the Fun Palace, Masdar City and Songdo all share some key characteristics. They all profess to present a new kind of environment, a solution to the challenges of urbanity. What this means for each of these projects varies.

New Babylon and the Fun Palace foresaw a societal change coming and positioned themselves as facilitators of this new form of civic life. Citizens and visitors would be provided with a framework but with no protocols for action. Agency was a central building block for these projects, where people would not only reside in the buildings, but very literally use them, shape them and rework them. They would be encouraged to engage with their environments via the latest technological apparatus.

Songdo and Masdar City on the other hand do not envisage a change in the civic structure our cities are built upon, but rather seek to first measure and then optimize the way cities are already working. The overarching theme of smart cities is to get cities under control, to make every process and action in the city visible, measurable and actionable. Cities are to be read by sensors, the data communicated through wireless connectivity and acted upon by algorithmic decision making.[101] Smart architecture and smart cities are therefore neither instruments of facilitating change, nor means to provide for new forms of civic life to arise. Their function is rather to be updated versions of what came before, much like updates in computer software.

All of the aforementioned case studies are based on different kinds of cybernetic feedback loops. They either respond to their inhabitants via direct interaction with explicit user interfaces or – especially in the contemporary cases – through data gathered indirectly, without active participation of the users.

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101 — Adam Greenfield, *Against the Smart City* (Do projects, 2013).

6.1.1. From Who and for Whom?

One of the main proponents of the Smart City agenda is Sidewalk Labs (founded in 2015 by Alphabet, parent company of Google). Daniel L. Doctoroff, CEO, thinks that reconsidering how we could build cities *"from the internet up"* will predominantly bring improvements. This new kind of city will give people *"more of what we love about cities with less of what we don't"*[102]. The key problem with this statement is the construction of a fictitious 'we', as if we already agreed upon what cities are or what they should be. Or as if any city or its residents were so homogenous that a uniform vision for these cities would be possible.

The drive for ubiquity is clear: Google acquired the smart home appliance company Nest for $3.2 billion already in 2014. In an interview with *Dezeen* magazine, Nest CEO Tony Fadell predicted that within the next ten years, *"everything that has a cord is going to have data in it."* In his view, technology should be embedded in the home in a fashion eliminating the distractions created by traditional technologies. In the future, appliances would recede into the background, different from our current experience of dealing with interfaces or smart phones. The claim is that this will make the home more *"conscious"* of its user.[103] Simultaneously this progress will make users *less conscious* of their homes. The stated mission is to have technology – or at least the experience of it – disappear. Whether this reverse side of Fadell's vision is a benefit is stated as matter of fact.

The moral and political frame of reference of the smart city movement is vague, except for its trust in technology solving many of the alleged problems of the city. What this movement considers problems to be solved include inefficiencies in resource distribution, management of urban utilities – such as water, waste and heat, and logistics of people and goods. Focusing on what can be measured necessarily leaves out what cannot. It might not be deemed efficient per se to create legislation for

102 — Daniel L. Doctoroff, "Reimagining the City from the Internet Up," (2016).
103 — Marcus Fairs, "Within ten years 'everything will have data in it', says Nest CEO." *Dezeen* (2014)

rent control. Ensuring an egalitarian existence for all citizens is a measure that does not often come up in smart city metrics. The movement situates itself outside, or even beyond, politics.

This has to do with the origin of the ideology behind smart cities. While many urban planning ideologies in the past were thought up by architects, urban designers and academics, and then went through the democratic process, the recent ideas of urban life germinate in the same corporations that provide the solutions for governments to purchase.

This generates a question: Is this a new planning ideology at all, or is it marketing talk disguised as ideology? The rhetoric and the core concepts are necessarily influenced by incentives for corporations to turn a profit. While companies and their lobbyists might use the forward-looking urban theorist language of the past and civic-oriented visions of the future, at the root of all is the business of technology. It is no coincidence that the people telling decision makers that cities need more technology are the ones providing it.[104]

Cisco, the provider of Songdo's smart infrastructure, makes no claims to the contrary, stating that they are "*filling a void in the industry*" by providing governments with both the technology architecture and a vision of "*how to use this technology to change societies*".[105] This change will allow Cisco to be not only the manufacturer of basic infrastructure, but also of consumer facing hardware and services that run on that hardware. When bundled together, they provide for a bombproof business model, leaving the company able to generate proceeds at every level of Internet-enabled utilities.[106]

In the case of Masdar, the City is treated like a huge living lab for the companies to develop products for a global market. Masdar City is essentially one large innovation hub. It is trying to attract high profile

104 — Greenfield, *Against the Smart City*.
105 — Lindsay, "Cisco's Big Bet on New Songdo: Creating Cities From Scratch."
106 — Ibid.

companies to set up facilities within the city and to use the city itself as a platform to test their latest smart & green technologies in a "*real life environment*".[107]

Masdar not only provides the urban platform for these innovations to be tested, but it also serves as a permanent showroom for them. The City and its tenants work in partnership testing these products and when they are finally taken to market, Masdar takes a cut of the profits, which explains how the city functions without tax revenue.[108] Masdar City is an investment enterprise in the shape of a town.

6.1.2. Data are Never Neutral

Data and the algorithms using them are often presented as neutral, merely as information that can be acted upon. No value judgement or politics are seemingly being enacted, because data are equated with *truth*. Data – or the new *big* data, which literally means a lot of data – are mystified to the point where there is little room for objections. In truth, even minor adjustments to the means information is collected can vastly affect the resulting data. Altering the height of an air pollution sensor by just a few meters can significantly alter the values it produces. Deeming one neighbourhood more "risky" than another depends on how crimes are reported and which crimes are deemed dangerous in the computations. Data are never 'just' data, but collection of decisions made regarding the methods its collection and computation.[109]

Behind the data there is always a context of institutions, programmers, politicians or public servants who control the data and act upon it. Urban information is not only being 'processed' without value judgment, but it is commodified, politized and operationalized.[110] This recent turn to data

107 — Cugurullo, "How to Build a Sandcastle: An Analysis of the Genesis and Development of Masdar City."

108 — Ibid.

109 — Greenfield, *Against the Smart City*.

110 — Shannon Mattern, "The City is not a Computer," *Places* (2017).

as a design and planning tool is dubbed *technoscientific urbanism*, which reflects a return to systems thinking and centralized planning, familiar to us from the postwar period.[111]

What kind of data can be collected in the first place? Are the citizens' health and welfare, their feeling of safety or the character of a community objectively measureable?[112] Many aspects of the lived experience such as atmospheres or word of mouth are not easy matches for databases. Most notably marginalized puopulations and indigenous cultures might easily be neglected, not to mention whole developing nations. [113] These infrastructures "*are in the business of exchanging information (and not meaning)*".[114] Even if it would be challenging to turn the more ephemeral aspects of the urban experience into collectable information, does not mean it can – or should – be disregarded.[115]

It is reductive to think that one could always foretell people's wants and needs in a deterministic, mathematical way. A technocrat would possibly claim otherwise: We already have data on cities that tell us what we need to know. When we embed data collecting apparatus into every place not already embedded with it, we will know even more. This of course is based on to the aforementioned misjudgment of data as neutral. Focusing on collectable data leaves out all the 'noise' necessarily present in every urban situation. When focusing on the data points of the majority, one will inevitably end up creating an environment where people in the margins are forgotten.

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111 — Shannon Mattern, "Instrumental City: The View from Hudson Yards," *Places* (2016).

112 — Ibid.

113 — Mattern, "The City is not a Computer."

114 — Ross Harley Gillian Fuller, "The Protocological Surround: Reconceptualising Radio and Architecture in the Wireless City." *Stereopresence Online Archive* (2011)

115 — Mattern, "The City is not a Computer."

6.2. A VAST MACHINE – LIFE IN A UBIQUITOUS WORLD

At the turn of the millennium computers and Internet connectivity were relegated to homes, schools and offices, and otherwise tied to specific locations and times of the day. Twenty years later, citizens and workers are connected at every hour of the day and monitored by countless services provided to us seemingly for free. This is a situation nobody actually planned. No one decided that we need this connectivity, these services and this amount of data generation and collection. The need to be present on social media was created as social media was created.

Benjamin Bratton describes our situation as an *"accidental megastructure"*[116] of planetary scale computation. This describes well the emerging pervasiveness of computation in our lives. We are constantly surrounded by technology that either receives information from us or sends information to us. That technology again is globally connected; data that are collected on us when walking on the streets of Helsinki might get computed on a different continent.

This new environment has been theorized as the *"protocological surround"*. This *"info-spatial"* environment is taking an increasing role in our built environments. It is an environment that cannot be sensed, that operates wirelessly and usually without us noticing. While it might be out of sight and by extension, out of mind, it is always working in the background, based on different protocols (hence the term *protocological*) and algorithms, creating an ostensibly seamless world of ubiquitous computing. It removes the need for recognizable architectural thresholds of windows, doors and entrances. Instead there are just *"thresholds of intensity"* affecting the way we move through our built environment without even noticing these thresholds.[117]

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116 — Benjamin H. Bratton, *The Stack: On Software and Sovereignty* (The MIT Press, 2016).

117 — Gillian Fuller, "The Protocological Surround: Reconceptualising Radio and Architecture in the Wireless City."

Along with this ever more intrusive role of algorithms and protocols are taking in our lives comes the question: Where do algorithms come from? They seem to operate in a kind of black box at the other end of your Internet connection. What are they trying to accomplish and how are they associated our lived daily existence?

6.2.1. Algorithms Are Routines

Algorithms have been around since the beginning of culture, before a distinct word was coined to describe them. They are simply sets of step by step instructions yielding a desired result. Rituals, social routines and the organization of space and time are the sources of algorithms. When we translate these organically emerging and ever evolving processes into computerized algorithms, the basis is still in a life lived. Big data and other buzzwords act to mystify and hide the fact that algorithms themselves *"rise from the intelligence of this world"*.[118]

Translating ever changing social relations and conventions into digital algorithms, protocols and automation means that *"the world is made and re-made not just by political decision, but by its dissolving of decision into automatic and prosthetic systems"*.[119] Algorithms never compute for themselves. They compute for some party, whether it be for governments, markets, industries or armies.[120] Algorithms need to be fed with information so they can function, consequently reducing the way citizens relate to their cities towards merely engaging with it through its systems, thus primarily *"serving as sources of measureable behavioral data."*[121]

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118 — Matteo Pasquinelli, "Three Thousand Years of Algorithmic Rituals: The Emergence of AI from the Computation of Space." *e-flux Journal* 101 (2019)

119 — Benjamin H. Bratton, *The Terraforming* (Strelka Press, 2019).

120 — Pasquinelli, "Three Thousand Years of Algorithmic Rituals: The Emergence of AI from the Computation of Space."

121 — Mattern, "Instrumental City: The View from Hudson Yards."

6.2.2. Who is in Control

All case studies presented in the previous chapter – possibly excluding the Fun Palace – in some way count as such ubiquitous environments, where the citizen – or the user – is enveloped by a kind totality. The notable difference between the eras is that while Price's and Constant's projects bear a clear relation to contemporary smart urban environments, they have a completely different approach to who would be put in charge.

In South Korea and the UAE citizens are subject to an environment purportedly working on their behalf. In the Fun Palace and New Babylon, the citizens themselves are explicitly put in charge. The Fun Palace visitor can literally see all the workings of the structure from top to bottom and can directly influence how those parts are organized and used. New Babylon's resident is not subject to an algorithm deciding on the most efficient way to have people pass through crowded spaces, but is instead tasked with creating different atmospheres, not just one of productivity. Constant himself stated that *"those who think that the rapidity with which we move around and the possibility of telecommunications are going to dissolve the common life of agglomerations have little idea of humanity's true needs."*[122] Not everything in life is quantifiable – or reducable to efficiency.

However abstract and even utopian, the descriptions of the Fun Palace – read through the contemporary frame of reference – bring to mind the info-spatial environment taking shape around us. The Fun Palace was meant to be a structure where one could choose either to have fun, learn new skills, interact with other people or just relax. Where you could see what other people are doing, or follow what is happening in other parts of the country or the world. An ever changing, democratic and non-hierarchical meeting place for all.[123] This is surprisingly reminiscent of the early days of the Internet and the optimistic visions that were born with it.

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122 — Constant Nieuwenhuys, "A Different City for a Different Life," *Internationale situationniste* 3 (1959).

123 — Hardingham, *Cedric Price Works 1952–2003: A Forward-Minded Retrospective*, 46-85.

Price's confidence in cybernetics and computing didn't waver after the Fun Palace project ended. In 1989, at the Architectural Association, he gave a talk on the role of computers in society. He claimed that *"it would be far better if computers spoke only to each other, and merely instilled in humans that feeling of well-being which results from knowing everything is under control."*[124] The problem presented in this kind of sentiment is what the Fun Palace might also have ended up enforcing if ever realized: a *"nefarious kind of social control – invisible, apparently freeing and constraining at the same time"*. The seemingly light-hearted or 'fun' activities within the Palace, described as ways into self-willed learning, might also be thought of as a form of control, motivating its visitors to learn but also to produce.[125]

Price actually seems to foreshadow our contemporary debate on smart cities and the Internet of Things, and casts his vote in favor, with the supposition that control is being exerted by a well-meaning party. Via this sentiment Price prefigures our contemporary debate on the Smart City and the Internet of Things, in which all manner of objects in our everyday environment are made to perpetually talk with each other.

The question of control is made all the more urgent by the description of an IBM control room in Songdo. The amount of information flowing through the city's copper veins is far too great for human cognitive processing capacity. Most of the urban data are actually analyzed automatically by IBM's algorithms and only in case of emergency a human operator is alerted. Control room managers reported extreme boredom and fatigue and needed therapy after sitting in front of control screens for hours and hours in front of control screens while algorithms toiled in silence.[126]

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124 — Price, "Fun Palace."

125 — Lobsinger, "Cybernetic Theory and the Architecture of Performance: Cedric Price's Fun Palace," 133.

126 — Orit Halpern, "Cloudy Architectures," *Continent* 4.3 (2015).

Fig 20: Incheon Free Economic Zone Smart City Integrated Operation Center in Songdo.

6.2.3. Can There be Change

If smart city algorithms can be considered social routines and habits written into code – and in the city building sense, literally in stone – what happens when there is a break in these norms? Human history full of changes in political regimes, societal structures or moral values. Large societal upheavals, for better or worse, have often happened against the odds, moving from marginal groups to the mainstream. Who would have predicted the Arab Spring, born partially in through the connectedness of citizens through social media platforms that were shut down when the government closed of Internet access for its citizens?[127] As Richard Sennett puts it: *"The algorithms of the CPU do not envision their own violation".*[128]

If we already live in an 'accidental megastructure', what should we think about the parts we are not building by accident, or about the cities and the hidden infrastructures that are planned every day? When we create automated technologies and embed them in our environments, we become entangled with them. They are not only results of the environments that produced them but also become part of these same environments. By the same logic, we are not only the ones using these technologies, but are necessarily shaped by them as well.[129]

Built environments and technical systems also inform human behavior. When humans interact with their environment, the data on the interaction are fed back into the system, thus creating a feedback loop where the technological infrastructures built by humans alter future human behavior which is again computed in the same systems, and so forth. This new kind of agency where citizens are framed as consumers and generators of data *"could end up shaping populations and building worlds in their own image."*[130]

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127 — Carlo Ratti, Anthony Townsend, "The Social Nexus," *The Electric City Newspaper: Urban Age Electric City Conference* (2012).

128 — Richard Sennett, "The Stupefying Smart City," *The Electric City Newspaper: Urban Age Electric City Conference* (2012).

129 — Bratton, *The Terraforming.*

130 — Mattern, "Instrumental City: The View from Hudson Yards."

The built environment has traditionally been a very rigid structure, lending itself to literally and figuratively cementing social and political structures. Constant's New Babylon sought to struggle against this "*architectural stasis"*, which was seen to stifle the possibility of a different life.[131] By using architectural representation methods, Constant himself turned a conceptual, ever-changing and hence intrinsically 'anti-architectural' utopian model into 'architecture'. Apparently he took note of this himself, as in later representations of New Babylon Constant favored more abstract line drawings, less reminiscent of floor plans and perspective renderings and more like abstract diagrams.[132]

According to Price, the Fun Palace was explicitly designed to accommodate *change* in the more tangible form of the building itself being ever changing in its form[133] and *chance* in the form of a "*prepared environment"* of *"as many forms of fun as possible … in the hopes of an eruption or explosion of unimagined sociality"*. The encouraging of social experimentation was pivotal to the project.[134]

When it comes to technological infrastructure, there is the declared intent of the technology, the *"dominant story",* and there is what the technology is actually doing. These two are not necessarily the same. In her book *Extrastatecraft: The Power of Infrastructure Space*, architect and Yale University professor Keller Easterling coins the term *disposition*. It describes the fashion of all infrastructures and organizations to shape their surroundings, both physical and political, in ways that are not necessarily produced by their primary function, or even their intent. They are *"active forms"* that shape our world through the relationships they form. When highways were first conceived, they were promoted

131 — McDonough, "Fluid Spaces: Constant and the Situationist Critique of Architecture," 96.

132 — Ibid., 98.

133 — Lobsinger, "Cybernetic Theory and the Architecture of Performance: Cedric Price's Fun Palace," 120.

134 — Wilken, "Calculated Uncertainty: Computers, Chance Encounters, and 'Community' in the Work fo Cedric Price."

through stories about uninterrupted movement, but they actually caused congestion. These dispositions may be produced by the form of the infrastructures, or they may be built in knowingly, hidden beneath their dominant stories.[135]

In ubiquitous cities, where there are countless layers of sensors and smart technology, these technologies will unavoidably also contain dispositions of many kinds. But how do we discuss the spaciality and repercussions of a new form that is everywhere and nowhere at the same time?

135 — Keller Easterling, *Extrastatecraft: The Power of Infrastructure Space* (Verso, 2014).

6.3. THE CLOUD IS HEAVY – PHYSICAL REALITIES OF DIGITAL INFRASTRUCTURE

Even though the Internet (or the Cloud) might seem to be nowhere – or *in the ether* – it still is somewhere. The Internet is one vast computing machine, interconnected at innumerable locations across the globe, impossible to map or to measure. But the parts of the machine are as physical as your laptop or smart phone. A proliferation of data centers, fiber optic cables, servers and Wi-Fi routers combine to make up this megastructure. Even the signals that our devices send and receive seemingly in incorporeal form are actually vibrations on the electromagnetic spectrum, measureable and describable through physics.

In the 19th century the term ether was used to describe an imperceptible substance where immaterial things such as light and radio waves traveled. When the telegraph and later the radio were invented, it was the first time that transmission was separated from transportation, unlike earlier forms of communication that had to be physically carried to their recipients. Many envisioned these ethereal technologies as conduits to the spirit world.[136] While ether was proven to be no-existent already a hundred years ago, the common conception seems to live on. The dominant story of wirelessness is one of disembodiedness.

6.3.1. The City Disappears

During early modernity, urban infrastructures like power plants and pumping stations were often proudly displayed for everyone to see, representing the promise of progress, proving that "*the road to a better society was under construction*". They later disappeared underground and out of sight, to give way to a cleaner and purer urban form, one where water, electricity and other utilities appear seemingly out of nowhere in particular.[137]

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136 — Shannon Mattern, "Code + Clay, Data + Dirt: Five Thousand Years of Urban Media," (2017), 2.

137 — Maria Kaika, Erik Sqyngedouw, "Fetishizing the modern city: the phantasmagoria of urban technological networks," *International Journal of Urban and Regional Research* (2008).

Digital technologies are implemented as a layer on top – or below – the existing urban fabric. Even nominally 'wireless' technologies actually need wires.[138] New generation 5G cell phones do not send their signals up into outer space but to the nearest base station, which should ideally be less than 100 meters away, with no obstructions like building in between.[139] A city wide wireless network is usually wireless only for some tens of meters, after which it relies on copper and fiber optic cabling.

This hidden layer of infrastructure has been called the *invisible city*.[140] It describes aptly the unseen world not only of communication, but also electricity, water or different kinds of codes and agreements. In the case of the smart city, what we experience are user interfaces, automated services and the convenience they provide. What we do not perceive are the vast amounts of capital and other resources that are required for the upkeep, building, maintenance and access to infrastructures.

The case for rendering technologies invisible is usually stated as one of *user-friendliness*. The inner workings are intentionally hidden away from user experience to make it feel easier and smoother, or "*friction-free"*.[141] The idea of computation and its interfaces *disappearing* into the background was already present at the very beginning of ubiquitous computation in the early 1990s.[142] But even then, it was made clear that there are risks involved that need to be taken into account. In a truly ubiquitous environment it is hard to know *"what is controlling what, what is connected to what, where information is flowing, how it is being used"*.[143]

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138 — Mattern, "Code + Clay, Data + Dirt: Five Thousand Years of Urban Media," 32.

139 — Susan Crawford, "The Next Generation of Wireless — "5G" — Is All Hype." *Wired* (2016)

140 — Lewis Mumford, "The City in History," (1961), 563.

141 — Sennett, "Building and Dwelling," 152.

142 — Weiser, "The Computer for the 21st Century."

143 — Weiser, "The origins of ubiquitous computing reserach at PARC in the late 1980s."

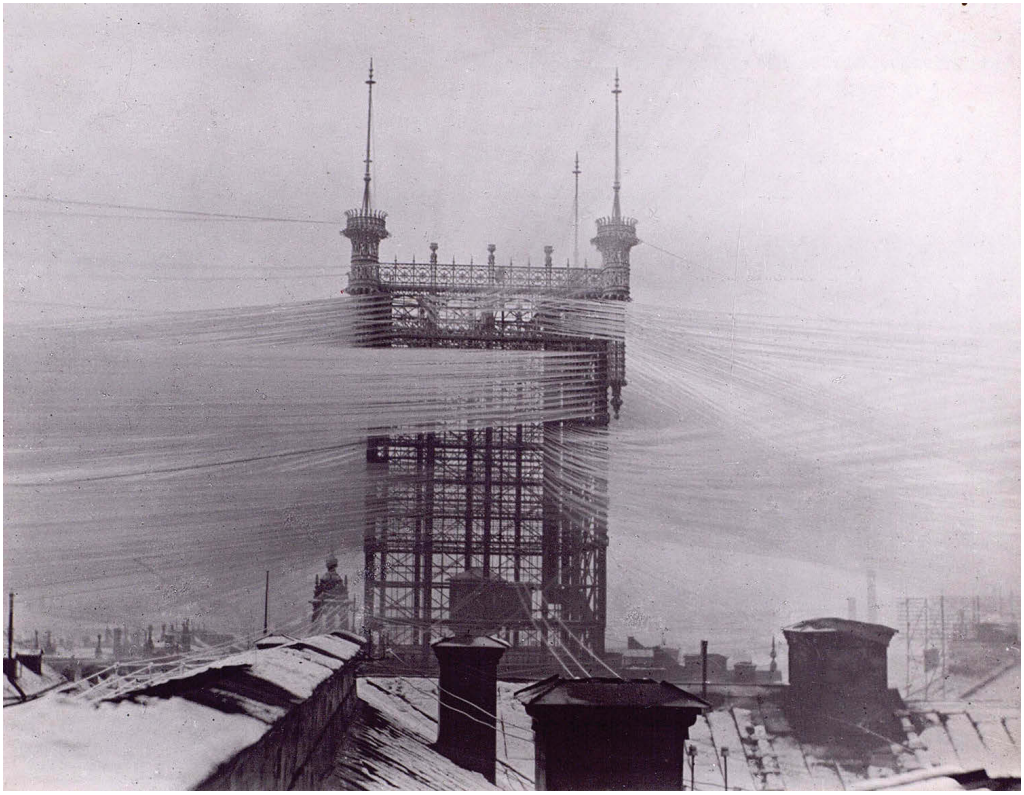

Fig 21: Stockholm's main telephone tower, designed around 1890, which carried 5000 phone lines that spread out accross the city. An example of infrastructure being extremely visible and legible to the citizen.

While a convincing argument can be made for the simplification and hiding away of technological apparatus for the sake of accessibility, there is also a potential downside to it. User-friendly cities may passivate their citizens. Having to deal with obstacles and dissonances makes one more engaged, increasing one's understanding and awareness of one's surroundings. We *"become more cognitively alert by struggling with complicated realities"*[144]. In other words, by 'eliminating distractions' you actually conceal the complexities of the automated infrastructures. We need complexity of cities to keep them capable of reinventing themselves. While cities have always been home to conflicts, they have also had the capacity to triage conflicts, thus strengthening and "*making the urban, the political, the civic*"[145]

Contemporary smart systems "*cultivate an out-of-sight, out-of-mind public consciousness*",[146] in which you are not meant to experience or perceive the technologies that are working behind the scenes. This is vastly different from the approach of the Fun Palace, which could be considered one large machine itself. While inside it, you would presumably be able to see the inner workings of it, with cranes moving parts of the complex around in accordance to direct interaction with its users. The intention behind the Fun Palace was to be a *"giant learning machine"* or a *"critical tool"*, where visitors could experiment with the latest communication technologies. By learning about these intangible technological and cultural changes the visitors could mentally adapt and make sense of the accelerated pace of technological culture. [147,148]

The contemporary drive to make infrastructures disappear might produce a clean or 'harmonious' environment, but it also conceals any

144 — Sennett, "Building and Dwelling," 157.

145 — Saskia Sassen, "Does the City Have Speech?," *Public Culture* 25 (2013).

146 — Mattern, "Instrumental City: The View from Hudson Yards."

147 — Wilken, "Calculated Uncertainty: Computers, Chance Encounters, and 'Community' in the Work fo Cedric Price."

148 — Lobsinger, "Cybernetic Theory and the Architecture of Performance: Cedric Price's Fun Palace," 126.

Fig 22: One Wilshire, an office building in downtown Los Angeles, is where the Internet connections between Asia and the US meet. Its role as a *"major hub in the global network makes it the most expensive real estate in the country"*. The street in front of the building is dug up so often, that markings denotating the locations of cables have to be painted on the street for future reference. The asphalt is littered with these markings, exposing the complex infrastructure beneath the street.

clear aesthetic reference to the "*production relations underneath, severing the ties between 'surface-appearance' and the underground flows and networks*".[149] By looking at an image of Masdar City or Songdo, one could not tell them apart from any 'non-smart' new city.

At the beginning of ubiquitous computation, the idea of making technology 'disappear' into the fabric of everyday life was a way to *"get computers out of the way while amplifying human-to-human communication."*[150] In such terms, the concept sounds extremely promising. But there is a clear difference between being connected through distinguishable interfaces and structures, such as using an ATM or a subway turnstile, and having your presence and actions be recorded without your sensing it in any way. While computers might be 'out of the way', this does beg the question of *"what kind of engaged citizen we might imagine if citizenry isn't even really aware of its engagement anymore?"*[151]

6.3.2. What does a Smart City Look Like?

More often than not, a smart city looks exactly like a non-smart city would. Songdo does not immediately appear to be the world's leading ubiquitous city. Viewed from its Northeast Asia Trade Tower, South Korea's highest building, Songdo looks like any other new town that has popped up around Seoul since the 1980s.[152] Masdar City again relies on references and technologies from traditional Arabic architecture[153], and so does not project its eco-technological ideology into it's appearance.

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149 — Kaika, "Fetishizing the modern city: the phantasmagoria of urban technological networks."

150 — Weiser, "The Computer for the 21st Century."

151 — Gillian Fuller, "The Protocological Surround: Reconceptualising Radio and Architecture in the Wireless City."

152 — Townsend, *Smart Cities: Big Data, Civic Hackers and the Quest for a New Utopia*, 27.

153 — Ouroussoff, "In Arabian Desert, a Sustainable City Rises."

> *"The city maintained its old forms in the end. High technology vanished and became invisible, either in the sky, hidden behind historical masks or kept well away from the city that it serves."*[154]

We live within the influence of global information networks which are permanently out of sight. The forms of our contemporary built environment do not include representation of our current cultural and technological condition, but rather follow the aesthetics established long before the world of electronics came around.[155]

New Babylon on the other hand would have clearly stood out from its surroundings. In a sense, it totally disregarded any existing context, suspended high above the earth's surface, a completely new world leaving the old one behind.[156]

Being as much machine as architecture, the Fun Palace would also have stood apart from its surroundings. Even if it had been built, it would probably have ended up lookin perpetually 'unfinished', because of its aesthetics and continuously alternating organization. [157] Price himself doubted that the building would ever look the same twice. [158] The shifting nature of the building challenged the idea of architecture as a *"permanent signifier of social values"*.[159]

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154 — Murphy, *Last Futures: Nature, Technology and the End of Architecture*, 216.

155 — Ibid., 214.

156 — McDonough, "Fluid Spaces: Constant and the Situationist Critique of Architecture."

157 — Wilken, "Calculated Uncertainty: Computers, Chance Encounters, and 'Community' in the Work fo Cedric Price."

158 — Lobsinger, "Cybernetic Theory and the Architecture of Performance: Cedric Price's Fun Palace," 121.

159 — Ibid., 120.

6.4. DO WE NEED IT AND DID WE WANT IT?

What is the motivation for having these smart technologies invade our existence in the first place? Was there an idea of implementing communication and sensor technology into every single thing before it was possible? Or did the smart city ideology emerge in conjunction with the technology making it possible? Is the smart city a *"solution looking for a problem"*?[160]

"Were our cities dumb before we had building information modeling (BIM) software, before machines could count the number of cars passing through their intersections?"[161] One might consider the city to be an information system in itself, even before adding any communications technology into the mix. The city is a complex organism that never works in perfect synchrony. A city is not a unified whole, it is an ever-changing system that includes dissonance, resistance and difficulty that citizens come face to face with and learn from. This precisely might make cities multi-layered, experientially rich and diverse.[162]

Smart cities are first and foremost "*technical solutions to social problems*" that promise *"order over disarray … as a path to an emancipatory politics of modernity"*[163]. Both in Masdar City and Songdo the actual focus can be found elsewhere. The less explicitly stated goal of Songdo is to work as a *"weapon to fight trade wars"*.[164] Technology is added to the project in order to make it more attractive to multinationals who would hopefully be enticed by the progressiveness and novelty of it all. Interestingly, while Songdo was making all infrastructural systems of the city more controlled and regulated than ever, the district simultaneously boasted

160 — Amy Frearson, "'Smart technology is a solution looking for a problem,' says Rotterdam Biennale curator." *Dezeen* (2016)

161 — Mattern, "Code + Clay, Data + Dirt: Five Thousand Years of Urban Media," x.

162 — Sennett, "The Stupefying Smart City."

163 — Mattern, "The City is not a Computer."

164 — Townsend, *Smart Cities: Big Data, Civic Hackers and the Quest for a New Utopia*, 24.

less regulated markets and lower taxes[165], all according to the plan of adding yet another special economic zone[166].

Masdar City's goals are equally thinly veiled. The City is essentially a product, produced by Masdar. It is a special economic zone whose benefits include 100% exemption from corporate and personal income taxes and import tariffs, with the freedom to repatriate capital and profits.[167]

6.4.1. What is Smart?

The word *smart* is defined in different ways depending on the context. It describes a person or a concept that shows a high degree of mental ability. But regarding technology, it can also mean that it is operated by automation or that it has built-in information processing capabilities.[168] It is a recurring metaphor to regard the human brain only as a complicated biological computer[169], and reversely regard the computer as an electronic brain, possessing smartness or *artificial intelligence* similar to ours.

Smart is a catch-all term for gaining more control over the city, unlike before when controlling such a complex organism was an overwhelming task which has encountered as many failures as successes in the past. This control would purportedly enable governments to make cities more *"livable, equitable and resilient"*. But what actually are the actionable metrics that allow for these values to arise? "*Are all things better when they're quick and easy?"*[170]

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165 — Sennett, "Building and Dwelling," 159.

166 — Special Economic Zones are enclaves within nation states where markets and taxing are less regulated. Originally created as a temporary tool for developing nations to enter the global market, these zones have now proliferated around the world. (Easterling, *Extrastatecraft: The Power of Infrastructure Space*)

167 — Masdar.ae, "The Source of Innovation and Sustainability - Investment and Leasing Opportunities at Masdar City (brochure)," (2020).

168 — Definitions from Merriam-Webster online dictionary.

169 — Mattern, "The City is not a Computer."

170 — Mattern, "Instrumental City: The View from Hudson Yards."

In opposition to efficiency and controllability, it might precisely be the *incompleteness* of cities that makes them unique and actually, *smart*. They can constantly be remade, for better or for worse, and that is why many great old cities have outlasted empires and nation states of history. While cities have always been intelligent in their capacity of mediating conflicts and embracing change, the smart city ideology is now creating closed systems that will eventually become obsolete, as they are not malleable enough for natural urban evolution.[171] Closed systems *"will become obsolete sooner. And, as these complex technical systems become obsolete, they may drag down with them the buildings within which they are housed."*[172]

Cities of history provide endless examples where new thoughts or new forms of industry have proliferated precisely in the areas in between, in the peripheries. Constant modeled New Babylon on the marginal and forgotten spaces of cities, where *"outcasts of the utilitarian society stick together… where minorities, artists, students, prostitutes and intellectuals are living together"*[173]

What has changed since the times of New Babylon and the Fun Palace is the societal focus. In the counter-culture-fueled 1960s and 1970s there was an atmosphere where mainstream culture was to be critiqued, and preconceived notions of social structures were to be questioned. Both New Babylon and the Fun Palace were described as temporary and ever changing. They took into account that one can never really predict how a city is will evolve, what kind of attractions it will have and what challenges it will encounter.

Over the years of envisioning New Babylon, Constant would "*repeatedly condemn architects for simply providing spaces for current society"*[174]. In his mind – as in Cedric Price's – no one could ever foresee the needs of people in

171 — Saskia Sassen, "Urbanising Technology," *The Electric City Newspaper: Urban Age Electric City Conference* (2012).

172 — Ibid.

173 — Wigley, *Constant's New Babylon: the hyper-architecture of desire*, 13.

174 — Ibid., 30.

the future. This was evident in the Fun Palace's planned ten-year lifespan. According to Price, any structure should only stand as long as it was socially relevant.[175]

Price writes about the Fun Palace's motives: *"The increasingly obvious reduction of the permanence of many institutions … allied with the mass availability of all means of communication, has demanded an almost subconscious awareness of the vast range of influences and experiences open to all at all times."*[176] One can't help but find similarities between this thinking and the situation we are in now, with access to communication and information ever more embedded in our lives.

Although the name Fun Palace came about *"at an alcohol-inspired brain-storming session"*[177] and was described by Littlewood as *"so wrong, it's right"*[178], it does give indication about the values at play. The difference between the ideology behind Littlewood's and Price's project and our current 'smartness' paradigm is that the aim of the Palace was to give people freedom, to choose what they wanted to do, have fun or to do nothing at all.

In our current neoliberal time – 30-ish years in – the focus is on looking at the world as it is and helping in its daily remaking by improving its reproductive process and making it ever less noticeable. The smart city ideology makes explicit assumptions about what people want based on what either the manufacturers think they want or what the data they have collected claims they want. When one uses the current state of things as a starting point, one necessarily ends up reproducing the said state of things. The smart city becomes a machine for social reproduction like no other before it.

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175 — Wilken, "Calculated Uncertainty: Computers, Chance Encounters, and 'Community' in the Work fo Cedric Price."

176 — Price, "Fun Palace," 21.

177 — Cedric Price, "Cedric Price Talks at the AA," in *Cedric Price Works 1952-2003: A Forward-minded Retrospective: Articles & Talks*, ed. Samantha Hardingham AA Publications, 1990), 418.

178 — Hardingham, *Cedric Price Works 1952–2003: A Forward-Minded Retrospective*, 48.

When we 'over-design' our environments, we automate action. This displaces deliberation and decision making as everyday skills of people into parts of the environment itself, making it on the one hand dynamic but on the other, predictable.[179] In a Fordist tradition of deskilling, Masdar City is now deskilling its citizens of *"street smarts"*.[180]

Anthony Townsend describes a possible future of Songdo, where data have been collected for decades and at least the physical systems of the city have been fully optimized. At best the city might provide us with entirely new ways of thriving. One of the scenes Townsend paints is where millions of remotely controlled motors automatically open windows to catch the evening sea breeze. But could you not open windows before? Is there not some value in citizens understanding their environments in a way that they too know when the evening breeze is coming, instead of just submitting to the loving grace of their surrounding technologies?[181]

It is not that technology is inherently incompatible with the city or its complex interactions. Technology in one form or another also birthed the city, whether it be the technology of building cities or the technology of farming that lead to a specialized workforce and eventually the creation of cities. Digital technologies are just the latest in line. There is also a case to be made for using technology in cities such that it does not prescribe action but coordinates it. *"The prescriptive city is closed; the coordinative city is open"*[182].

> *"For what is the use of the most astonishing technical inventions that the world now finds at its disposal if the conditions for deriving benefit from them are lacking, they contribute nothing to leisure, and the imagination defaults?"*[183]

179 — Bratton, *The Terraforming.*
180 — Sennett, "The Stupefying Smart City."
181 — Townsend, *Smart Cities: Big Data, Civic Hackers and the Quest for a New Utopia*, 29.
182 — Sennett, "Building and Dwelling," 144.
183 — Nieuwenhuys, "A Different City for a Different Life."

It is not the smartness itself that fails these cities, but their prescriptive, top down nature. In our eagerness to equip the cities with the latest technologies, we take the risk of creating an environment that is invisible and ubiquitous, and silently monitors and prescribes our everyday behavior. We risk losing what made cities great in the first place, their ability to adapt and to mediate.

Technology has developed at such a quick pace leaving no time to assess its possibilities and/or threats. As Richard Sennett puts it in parable form, it took surgeons nearly a century after the invention of the scalpel to figure out best practices of using it.[184]

184 — Sennett, "The Stupefying Smart City."

7. EPILOGUE

When I started researching for this thesis I was very interested in data centers and submarine cables, the vast physical infrastructures that manifest the Internet in the peripheries of our experience. There was a larger group of possible case studies and including some from the 1990s, between my chosen case studies from the 1960s and 2010s. I decided, with the guidance of my tutor, to stick to the chosen in order to avoid an unnecessarily broad scope for a Master's thesis.

Even with this narrower scope, I found it hard to stop branching out, to draw the outlines of this research subject. I realized that reading on the subject matter would never reach 'completion', as every time I discovered a new writer or an interesting text it would inevitably lead me to tens of other potential references, all of them just as interesting and as valuable as the ones I had already read.

Right up to the last weeks of writing this thesis I kept coming up with more and more interesting and relevant writing on the subject matter. I wish I had come in contact with some of the references earlier and had had the time to get to know them more thoroughly; namely Adam Greenfield's *Against the Smart City*, which seems to make many of the exact points I am trying to make in this work.

In a similar manner, I tend to keep forgetting the focus of this work: when reading about the cases I concentrate only on their specifics and histories. When reading about contemporary smart city ideology and their critiques, I again tend to forget the cases. A more experienced writer might know how to implement research methodologies that keep the framework of the research intact.

I set out to see whether the political ideologies differ among my chosen cases and found that they do: I also found that especially in the contemporary cases many other factors arise. For example, I repeatedly ran into the topics such as political economy and sustainability, but

lef them outside the scope of this thesis. Many smart cities are also referred to as eco-cities, and this connection between technology and sustainability would warrant more research.

Another topic that is not covered in this thesis is the coming adoption of 5G, which will make the technologies described in this thesis ever more pervasive. This would have been especially interesting in the Finnish context, which is similarly lacking in this thesis. While it would have been rational to also look closer for cases to study, the chosen contemporary cases remained as my chosen ones because of them already entering the canon of the smart city discussion, in a similar way that New Babylon and the Fun Palace are canonized in the history of architecture.

My positioning in relation to the topic of this Master's thesis is one of simultaneous enthusiasm and scepticism. I am a fan of technology and have grown up with the Internet. Since my early teens I have spent considerable amounts of my free time online, even before there were smart phones and mobile Internet connections.

I have been a first adopter in many cases where new technologies and services have become available. I feel that my close relationship and my inherent interest in digital technologies have provided a good backdrop for this work, as I do not consider myself a luddite or a technology sceptic by default, but have thought about my relationship to them for a long time.

I also have to note that an important point came up in Shannon Matterns article *Cloud and Field*, regarding the need to 'discover' or 'de-mystify' the cloud and its infrastructures. Her colleagues pointed out that in many parts of the world, such as in developing countries, infrastructure is not as mystical, hidden or even well-functioning as in developed countries. All over the world there are cable-layers and e-waste handlers who have tangible knowledge about these infrastructures. The presumption that this world is by default 'hidden' and needs to be discovered by people such as yours truly, signals great privilege.

In 2013 Rodolphe el-Khoury, then Director of Urban Design, University of Toronto, came to give a lecture on the Internet of Things at Aalto University. I asked him whether he was worried about the implications on consumption and resource extraction of having every mundane thing embedded with digital technology and necessarily becoming obsolete after the technology inevitably breaks down. As a reference, I used his own example of a *smart blanket* that would monitor its owner in their sleep. He responded that the blanket would of course not become obsolete, it would still function as a blanket. I tried to ask if he thought the owner would be content with just a plain old blanket, when they had clearly seen a need for the cybernetic one – or at least this need had been created for them – but got no clear answer. Most important on my mind was this: Did we need the blanket to smarten up in the first place?

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9. IMAGE SOURCES

Fig 1: Image source: Buckminster Fuller Institute
Caption source:

Fig 2: Image source: MOMA
Caption source: Toraldo Di Francia, Cristiano. "Continous Monument." cristianotoraldodifrancia.it Accessed 8.5.2020, https://www.cristianotoraldodifrancia.it/continuous-monument/.

Fig 3: Image Source: Canadian Centre for Architecture
Caption source:

Fig 4: Image source: Deutsches Architekturmuseum
Caption source: Blake, Peter. "Walking City." The Archigram Archival Project (1968): Accessed 8.5.2020, http://archigram.westminster.ac.uk/project.php?id=60.

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Fig 6: Ibid.

Fig 7: Ibid.

Fig 8: Ibid.

Fig 9: Ibid.

Fig 10: Canadian Centre for Architecture

Fig 11: Ibid.

Fig 12: Ibid.

Fig 13: Ibid.

Fig 14: From Etienne Malapert's project *"The City of Possibilities"*

Fig 15: Fosters + Partners

Fig 16: Etienne Malapert

Fig 17: Antonino Savojardo

Fig 18: Kohn Pedersen Fox Associates

Fig 19: Antonino Savojardo

Fig 20: Adrian Lustenberger

Fig 21: Image source: Tekniska museet
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Fig 22: Image source: Google
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