Supermetabolism

The influence of Metabolism on the 20th century Superdutch

Abstract
In this thesis we study the influence Metabolism had on Superdutch and its architects. After analysing the two movements we learn that Superdutch is more diverse than expected, and is not specifically a movement, but more so a group of different architects with different beliefs that are labelled as a group. The two movements did however have a lot in common in the way they were created and the beliefs they had. Both consist of a group of younger architects that try to tackle problems in their countries like the lack of space and the stagnation of architecture. After this we came to the conclusion that Metabolism did not specifically have any influence on Superdutch but more so on the individual architects within this group. Take MVRDV for example, this architectural firm has a lot of overlap with Metabolism in its beliefs and standpoints, and their architecture therefore also tries to tackle some of the same problems. This overlap can also be seen in their architecture, which often has a lot in common with Metabolist architecture. But not all Superdutch architects have taken this inspiration and influence from Metabolism.

Scott Spoon, 4675177
AR2A011 Architectural History Thesis (2020/21 Q3)

15/04/2021

Table of contents

Introduction

The metabolist movement was a Japanese movement around the 1960's and 70's. It was mainly centralised in Tokyo and other larger cities in Japan, but was also applied in other countries on a smaller scale. Metabolism arose to tackle problems Japan had around the time like an increasing mobility and a lack of space. The movement then also focusses on mega structures that can grow organically and rapidly and on creating both more horizontal and vertical space. Metabolism was a movement that was mainly only ever kept on paper, However there are still buildings that were realised in this style, like the capsule towers and Odakyu Drive-in Restaurant designed by architect Kisho Kurokawa and The embassy of Kuwait, by Kenzo Tange.

Superdutch was another movement that took place in the Netherlands around the turn of the 20th century and started to lose traction after the financial crisis of 2008. It started as a defiance towards the older architectural firms because they never tried to innovate. Because of this drive for innovation buildings were often kept very experimental and Superdutch architects were often allowed to design expensive landmarks in cities as eye catchers. Some notable Superdutch architecture firms are OMA, MVRDV and Mecanoo.

This thesis departs from the hypothesis that the Superdutch movement was influenced by Metabolist ideas. I suspect this because both originated in the same manner and both try to tackle problems like a lack of space locally and globally. Furthermore there are also prominent superdutch architects like Rem Koolhaas who were also fascinated by metabolism and even wrote a book about it. Therefore it could be argued that metabolism had a significant influence on the superdutch movement. The main focus of this thesis will be about the extend of the influence metabolism had on the Superdutch movement. The main research question could then also be: "How did the late 20th century Superdutch movement get influenced by Japanese metabolism from the 1960's?"

Other books and research papers about these movements only looked at either one of the two subjects. Like *'Project Japan',* which focusses on Metabolism, from Rem Koolhaas and *'Superdutch',* which focusses on Superdutch, form Bart Lootsma. This thesis will however take these two movements and compare them with each other in order to learn about the similarities between the two and in order to see how one influenced the other.

After the introduction of the paper we will first conduct a literature review of the books *'PROJECT JAPAN. Metabolism Talks...'* by Rem Koolhaas and Hans Ulrich Obrist, and *'Superdutch'* by Bart lootsma in order to get a better grasp on the chosen movements. The book 'Project Japan' was partially written by Rem Koolhaas, a prevalent architect in the Superdutch movement, so it is likely that connections of the two movements could be made in this book. This book could afterwards also be compared to the book *'Superdutch'* by Bart Lootsma, which goes more in depth into the superdutch movement, and might give us a better understanding of the connection between the two.

Then after we have gained a better understanding of the two movements we will hold a comparative analysis between metabolist buildings and buildings from the superdutch movement. Buildings that could be compared in this way are: The capsule towers and the Odakyu drive-in restaurant by Kisho Kurokawa, the embassy of Kuwait by Kenzo Tange, the Silodam and the Dutch pavilion at the 2000 expo by MVRDV and the Rotterdam, by OMA. And finally after the comparative analysis a conclusion can be drawn, with all the previously acquired knowledge, about whether Metabolism has had any influence on Superdutch and how large this influence was.

1.1 Metabolism

After the second world war large parts of Japan's capital were destroyed because of bombardments. Even though Tokyo had to reconstruct most of its city and experienced rapid industrialization, the city did not do much to innovate on its urban structure. Demand grew for housing in the capital so housing was rapidly reconstructed on the empty plots to meet this demand, but infrastructure started to lag behind due to the lack of innovation in this field. Many propositions to solve the problem failed because there were too many complex problems that all arose at once: a large part of the population moving to the cities, automobiles becoming more available to the public, a lack of social services, shortage of land and the inexperience of authorities in charge all played a part in this (Lin, 2010).

A group of young architect, Kiyonori Kikutake, Masato Otaka, Fumihiko Maki, Noriaki Kurokawa and an architecutral critic, Nobor Kawazoe named themselves the Metabolists and tried to tackle all these problems at once. They presented a pamphlet with their manifestos and plans named '*Metabolism 1960, the Proposals for New Urbanism*' during the World Design Conference in Tokyo in 1960 (Schalk, 2014). Kenzo Tange, who is often regarded as their mentor, also published a scheme around this time called: '*A plan for Tokyo, 1960, Toward a Structural Reorganization*' (Lin, 2007).

The Metabolist movement tried to fix these problems all at once by completely re-imagining urban design instead of only adjusting the existing one and extended beyond the then current scope of the city. They focussed on unifying the city into one organic mega structure, which consists of large roads and sidewalks at it's core. Plots surrounding these roads could then be filled in with public, commercial and housing facilities which in turn get to grow and decline to fit the demand of the city. (Schalk, 2014)

The first ideas surrounding Metabolism only looked at city plans and how to expand these in efficient and organic ways, a notable example of this is Kenzo Tange's '*A plan for Tokyo, 1960, Toward a Structural Reorganization*' that suggests that Tokyo starts expanding over the sea instead of over land. Tange envisioned that this would be achievable by laying the focus of the city on the mobility of its ten million people, in turn creating a transportation system that was the physical foundation of the city, he then also said: "It is the arterial system which preserves the life and human drive of the city, the nervous system which moves its brain. Mobility determines the structure of the city." All the other roads would then derive from this original main axis and lead to the structures within the city. (Lin, 2007)

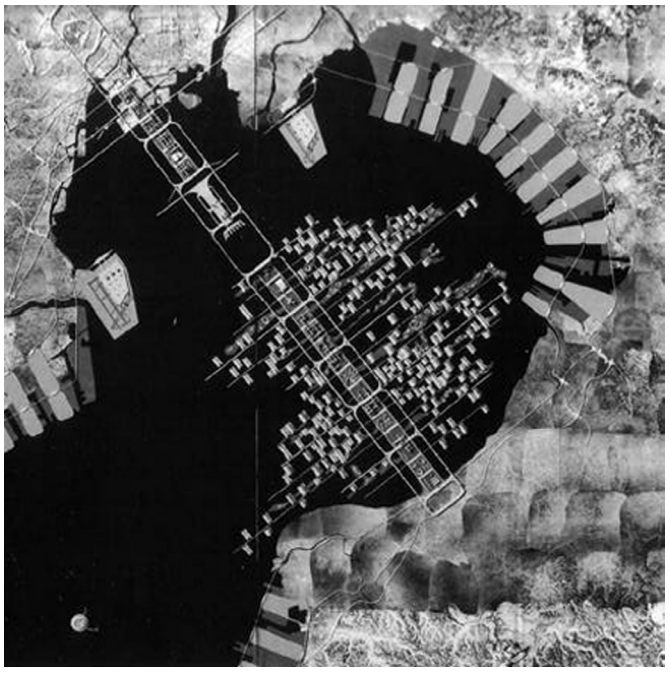


Figure 1.
A plan for Tokyo, 1960
by Kenzo Tange

From: https://arquiscopio.com/archivo/2012/07/14/plan-para-la-bahia-de-tokio/?lang=en

Later Metabolist architects also started looking at individual buildings and how they would fit into this design philosophy. These buildings would always roughly follow the same design principles as their urban counterparts, which means they also focussed on becoming an efficient mega structure that is able to shrink and grow according to demand. Examples of Metabolist buildings are: The capsule towers and the Odakyu drive-in restaurant, by Kisho Kurokawa and The embassy of Kuwait, by Kenzo Tange. We will look further into these buildings in the third chapter of this Thesis, where we will compare these three buildings with other superdutch buildings.

Figure 2. (Left) The Capsule towers, by Kisho Kurokawa
From: https://www.designingbuildings.co.uk/wiki/Nakagin_Capsule_Tower

Figure 3. (Right) The embassy of Kuwait, by Kenzo Tange
From: https://nl.pinterest.com/pin/549228117034094203/

The movement is more multifaceted than it first seems, multiple metabolists mention that they view the movement in different ways from each other and some even disagree with the terminology that should be used for the movement, like Kiyonori Kikutake for example, who argues that we should not use the term capsule but instead use Move-net (Koolhaas, 2011, p.139). This shows that the core philosophies of the Metabolists diverged from each other.

Other new principles that arose during the transition from urban plans to architecture was the use of capsules, these fall in line with the idea of organic growth and decline, because they could easily be placed on and removed from the building. Another principle is the use of artificial ground. This principle is important in metabolism due to the geographic nature of Japan. Japan is densely populated and has barely any space to grow, therefore artificial ground needs to be made in order to allow for the country to grow further. Take 'a plan for Tokyo, 1960' by Kenzo Tange for example. Here Tange created a lot of artificial ground on the water in order for the city to be able to grow further.

Ararta Isozaki, one of the Metabolist architects, also mention how Metabolism does not look at the context of the plan. They talk about how architecture has to exist independent of social context, beyond the implication of the whole movement, and call Metabolism anti-contextual (Koolhaas, 2011, p.51). One problem that arose with this anti-contextual and mega structure focused design process according to Isozaki however was that because of the sheer scale of the designs, together with them being out of context led to the problem of the buildings losing their human scale, which led to losing all forms of intimacy in the designs.

1.2 Superdutch

Superdutch started in the last decade of the 20th century when Rem Koolhaas slowly gained traction in the international scene. His designs and philosophies were seen as radical for how much they diverged from the then reigning architectural design trends whilst they also heavily searched for new fundamental architectural ideas. Because of the international fascination in Rem Koolhaas' work other Dutch architectural firms, like: Wiel Arets, Ben van Berkel, West 8, MVRDV, Neutelings and NOX also started gaining traction in the international scene in the following years. All these firms kept producing a constant flow of new plans, from which, relative to other countries, many got realised.

Many factors helped with the emergence of the Superdutch movement. At the end of the 80's globalisation became more and more prevalent in the Netherlands and it would only be a matter of time before this would pass over to the architectural scene. Up until this point, architectural styles were heavily mandated by the TU Delft and larger firms, which would impose their older styles onto the younger generations. Because of this Dutch architecture remained stuck in a 1950's modernist style whilst other branches in life kept moving forward. Architects and critics like Rem Koolhaas and Hans van Dijk then also heavily criticized the Netherlands for living in the past and strived to move forward in the architectural scene. (Lootsma, 2000)

Another factor that helped to form the superdutch movement was the recession in the seventies. Due to this recession there was little demand for architectural services, which in turn meant that many larger architectural firms weren't hiring new and younger architects. Because of this, this generation of architects was almost forced to start for themselves as either architects or writers. These startups would then in turn gain grants from the Stimuleringsfonds Architectuur and the Fonds voor de Beeldende Kunst, which allowed them to travel, publish and create opportunities for themselves. These grants led to more economic freedom and allowed these architects to experiment and express themselves instead of forcing them to conform to the views of the larger pre-existing firms. (Kloosterman, 2007)

Something notable about these Superdutch architects was their relative youth. Most of them were only in their end twenties or early thirties, with an exception of Rem Koolhaas, who was in his forties at this time. The presence of all this youth in the architectural scene was due to the new focus on globalisation and innovation in the nineties. This shift of focus happened in a short span of only 5 years and younger architects had the benefit of starting with a clean slate, unlike the older generation of architects that had to get used to and adjust to this new focus. This, together with their willingness to take risks and experiment allowed this generation to get an edge over the older ones (Lootsma, 2000).

The architectural scene in the Superdutch movement was diverse, and there was a lack of a clear guideline about which design elements should fit in a Superdutch movement. Superdutch was more so a group of young Dutch architects that all happened to become renowned internationally, instead of a group that formed a movement together. Because of this the architecture within this movement was diverse and differed greatly from each other, which makes it hard to pinpoint an exact style that they used in their works.

There were, however, still a couple of overarching characteristics by which most Superdutch buildings could be defined: The architects were always allowed to keep their designs experimental and were often asked to make their buildings iconic in order to improve the look of the city (Giele, 2020). This allowed for the architects to not feel restrained and use all their creativity in their projects. Furthermore, other design aspects that were common were slanted surfaces, wavy roofs and hard lines (Joostdevree, nd), but these aspects were not always present.

Some notable Superdutch buildings are: the Rotterdam by OMA, and the Silodam and the Dutch Pavilion at the 2000 expo by MVRDV. These together with many other Superdutch buildings got realised throughout the Netherlands. Though the styles of many Superdutch architects did vary they all tried to abstain from the old modernist movement and find their own way with a focus on globalization. In the third chapter of this thesis we will once again look at the aforementioned buildings and will compare them to metabolist buildings in order to discern Superdutch got influenced by Metabolism or not.

Figure 4. (Left) The Silodam, by MVRDV
From: https://www.mvrdv.nl/projects/163/silodam

Figure 5. (Right) The Rotterdam, by OMA
From: https://www.archdaily.com/451377/de-rotterdam-oma

Chapter 2: The influence of Metabolism on Rem Koolhaas and MVRDV

In this chapter we will conduct a literary review on books, articles and papers that might give us a better understanding of the influence of Metabolism on the Superdutch movement. We will look at the work of two Dutch practices in particular: those of OMA (Rem Koolhaas) and MVRDV and compare them to Metabolism individually.

The first architect we will have a closer look at is Rem Koolhaas, he is one of the most important Superdutch architects and even wrote a book about Metabolism called: 'Project: Japan: Metabolism talks.' This book will also be the main way in which we will look at the influence Metabolism had on him. We will also do an analysis on the architectural firm called MVRDV, and we will do this through the book 'KM3' which was written by them. This book talks about large global problems and how MVRDV among others want to catalogue and find solutions for these problems through experimentation and designing architecture.

2.1 Rem Koolhaas and the Metabolist movement

Rem Koolhaas is equal parts theorist and designer. Over his 40-year career Koolhaas challenged the ideas of programs and the interaction of space with his designs and his works always remain controversial in the architectural world (Lynch, 2019). Koolhaas always tries to keep his works broad and diverse, he does not only focus on architecture, but also on larger scale planning, critiquing and on writing (Ouroussoff, 2012).

Koolhaas likes to keep his works controversial and provoking by blatantly critiquing architecture and life in his works and does not tone them down to land commissions (Ouroussoff, 2012). Due to this reason the opinions of the architectural world on his works can be very divided. Take the CCTV Headquarters in Beijing, China, completed in 2012 for example. This building is critiqued by many, like Martin Filler who in the 'New York Review of Books' calls the building a: "bogus semblance of transparency". Whilst also being considered "2012s the building of the year" by Archdaily and "The Best Tall Building Worldwide" by the Council on Tall Buildings and Urban Habitat (Rosenfield, 2017).

Figure 6.
The CCTV Headquarters, Beijing
by Rem Koolhaas, 2012

From: https://www.archute.com/the-cctv-headquarters-by-oma-squashes-the-exhausted-typology-of-the-skyscraper/

At an earlier stage in his career Koolhaas also completed Delirious New York, an urbanist manifesto that would come to define his future architectural strategy. In the book, Koolhaas talks about the city's culture of congestion as a cultural incubator. He believes that the city is a place where chance interaction could amount to innovation and creativity. These texts are also the first time that Koolhaas lets his ideas of cross-programming comes forward, in cross-programming functions are introduced into buildings that usually should not be there (Lynch, 2019). This notion goes in line with his idea of unexpected interactions creating innovation and creativity and can still be seen in his later works. Take the Rotterdam for example, which we will further discuss in the third chapter, this building consists out of many diverse functions like office spaces, a hotel, a public space and housing all in one building.

Koolhaas also tried to keep the design of his projects as diverse as possible and never tried to establish a constant look like many other architects do. Instead, he focused on creating architecture that best fit the needs of the site and client with the newest of technologies and materials. Take the Bordeaux house for example, here he designed a large and dramatic elevator, for a client in a wheelchair, in the middle of the room that connects the floor together (Britannica, 2009).

Koolhaas also has a large drive to go international (Koolhaas, 2011, p.241, 307). Many of his projects are realised internationally and he asks multiple Metabolists why they never went international and how this was a missed opportunity. However, they all reply by saying that they really never thought about going international and that the main philosophy of the movement was focusing and improving Japan and that looking at the international scene was not the purpose of the movement. Even though the movement did not go international as a whole, Kenzo Tange went international on his own, realising his projects outside of Japan throughout Asia and the Middle East.

Koolhaas Mentions in an interview with the Metabolist architect Fumihiko Maki that metabolism has two sides to it: one is very formal, very strong and very harsh, the other shapeless and undefined (Koolhaas, 2011, p.37, 313). They then go on and talk about various Metabolists and discussing on which side they fall. Here Koolhaas mentions that he thinks that he himself is also part of the first formal side, and that he is more interested in the shapeless side because of this. Koolhaas also believes that it is considerably more difficulty to be a part of the second group and how these people naturally gravitate back the formal side. Fumihiko Maki was one of the more prominent formless Metabolists but even he switched to the formal side later in life. Maki, however, did design buildings like the Golgi Structures before switching sides.

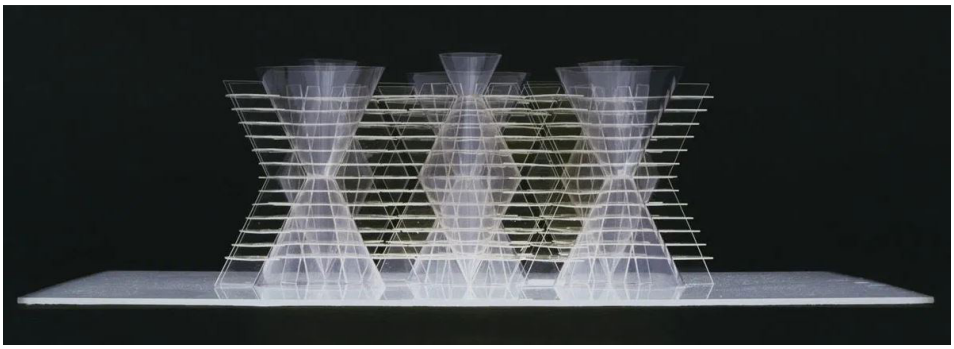


Figure 7. The Golgi Structure by Fumihiko Maki, 1968

Koolhaas' gripe with Traditionalism also coincides with his opinion on Metabolism and the importance of the traditional Japanese house in the movement (Koolhaas, 2011, p.485). He argues that it is tiring that the capsules, which are prevalent in the movement, are referring back to the traditional Japanese houses because of the nature of Metabolism. He says that Metabolism is all about being unorthodox and out of context and that because of this they should not base one of their core principles on traditional Japanese architecture.

Other opinions that Koolhaas has on Metabolism has is that the movement was more tolerant and polite than previous Japanese movements (Koolhaas, 2011, p.300), That the movement was an argument for being democratic (Koolhaas, 2011, p.133), that the movement had incredible visual and eloquent production (Koolhaas, 2011, p.383), and that this movement made Japan more advanced than the western world (Koolhaas, 2011, p.485). Even though all these opinions do not say much about the influence Metabolism had on Koolhaas, they do paint us a picture of his opinion of the movement and which parts he did not agree with.

2.2 MVRDV

MVRDV is a Dutch architectural firm that is led by Winy Maas and was also part of the Superdutch movement. They firmly believe that there is a lack of space on earth and that this is becoming a global problem. We are increasingly consuming more and more per person and the world population keeps growing too (MVRDV, 2005, p.22), which slowly turns our society in something unsustainable. They then also try to look for ways to solve these large problems through innovation in architectural design.

MVRDV believes that architecture is vital in solving this global problem and that instead of going along with it and pretending that nothing is wrong, we should strive for creating possible solutions (MVRDV, 2005, p.39). This focus on solving these problems will require idealism and pragmatism of research and practice, and even smaller projects can be of great value if they bring results.

This focus on solving the increasing demand for space is not something new, other architectural groups and movements already looked into this prevalent problem and MVRDV also studied these (MVRDV, 2005, p.47). They talk about Metabolism and how this movement faced the same problems. Metabolism was largely driven by the fact that Japan's surface area was limited and that the country needed to look for creative ways of creating space. MVRDV thinks that this problem is something that should be tackled globally and that there are various ways in which this could be done, and that through experimenting and designing we can find the best solution moving forward. One of these proposed solutions is the "Hyperoptimized World" (MVRDV, 2005, p. 74). In this solution we need to start looking to the world as a whole and start refilling it as efficiently as possible. In this solution we would achieve this be relocating cities, rural areas, industries, etcetera to a point where everything is located as efficiently as possible, which in turn allows these zones to take up less space and therefore gives us more empty space to work with in the future. This way of global thinking is the opposite of Metabolist thinking, both ideas focus on creating more available space but Metabolism tried to keep everything local and never strived for going international, whilst the Hyperoptimized World idea necessitates going global in order to work properly.

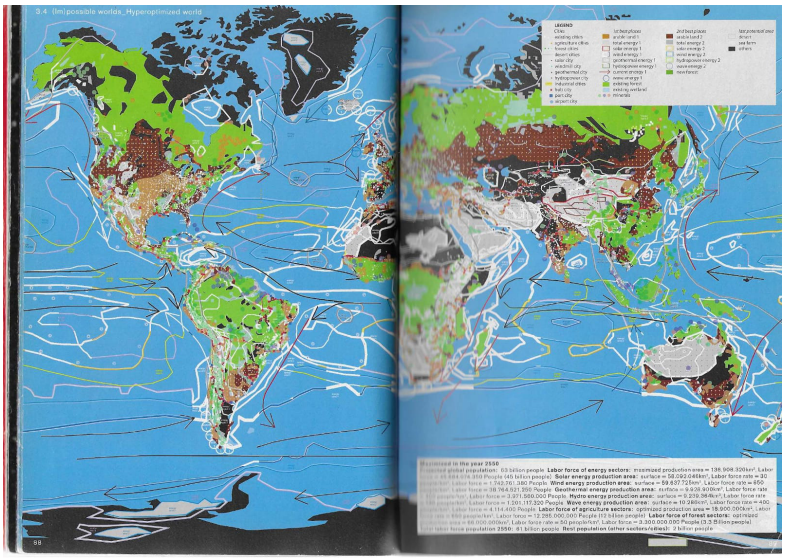


Figure 8.
A map of the Hyperoptimized world
a scan from the book KM3 by MVRDV
2005

MVRDV also argues that architecture is still too 2D and should start thinking more in the 3D sense. Meaning that we should start utilizing more layers for public functions and for improving the quality of cities (MVRDV, 2005, p.270). They mention that this desire for a stacked city is not new and has been around for longer. This idea of creating horizontal space falls in line with Japan's lack of space and the Metabolists take on this. The metabolists did not only look at creating more horizontal space, through the means of designing floating cities, but also looked at creating more space by building more vertically. Take the Odakyu Drive-in restaurant by Kisho Kurokawa for exmaple, this building also looked at creating more vertical public space by suspending large platforms from a steel construction.

Figure 9.
The Dutch pavilion at the 2000 expo by MVRDV, 2000

From: https://www.mvrdv.nl/projects/158/expo-2000

Chapter 3: Comparing the movements buildings

In this chapter we will be comparing varying prominent Metabolist and Superdutch buildings with each other in order to gain a better understanding of the relation between the two movements. Whilst doing so we will also take the literary review from the previous chapter into account to form a conclusion on the enacted influence. The buildings will first be inspected individually after which we will compare them with each other. For Metabolism we will take three realised buildings that were made by two of the more prominent Metabolists: The Capsule towers and the Odakyu Drive-in Restaurant by Kisho Kurokawa and the embassy of Kuwait, by Kenzo Tange. For the Superdutch movement we will likewise take the buildings of two prominent Superdutch architectural firms: The Rotterdam by OMA, and The Silodam and the Dutch Pavilion at the 2000 expo by MVRDV.

3.1 The capsule towers, by Kisho Kurokawa

The capsule towers are two towers that were designed and completed in 1972 by Kisho Kurokawa and are located in the Ginza area of Tokyo. These towers can be seen as the poster child of Metabolism, because their main focus is organic growth and modularity. The design consists of two towers each standing 14 stories high and consist out of a central shaft with capsules placed around it. The tower is divided into two functions, the private capsules of the tower and the public central shaft.

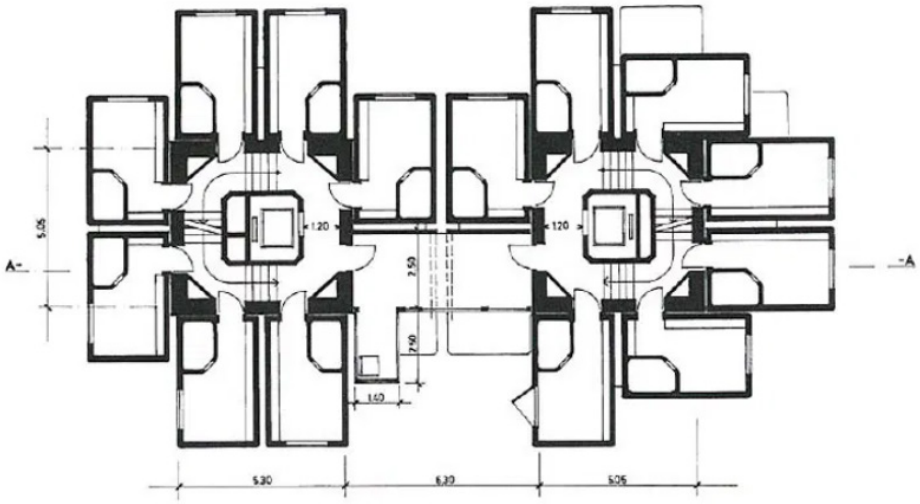


Figure 10. (left) The Capsule towers, by Kisho Kurokawa
From: https://en.wikipedia.org/wiki/Nakagin_Capsule_Tower

Figure 11. (right) Floor plan of the capsule towers
From: https://archeyes.com/nakagin-capsule-tower-kisho-kurokawa/

The capsules consist of single households that were created with the intention of housing traveling businessmen that worked in central Tokyo during the week. The capsules are relatively small, having an area of 4 x 2.5 meters and are designed in such a way that they can fit as much private functions as efficiently as possible. All pieces of the capsules were pre manufactured in a factory outside of Tokyo, and then transported to the site by truck. The pre-assembled interior features a circular window, built-in bed and bathroom, and is furnished with a TV, radio and alarm clock. The capsules were inserted in the shipping containers by use of a crane, and then fastened to the concrete core shaft (Sveiven, 2018).

There are 144 capsules in total, which were connected to the central shaft with high tension bolts to allow for easy replacement of the capsules, this focus on replaceability also falls greatly in line with the Metabolist view on organic growth and decline in order to fit the demand. The central shaft also greatly falls in line with Metabolism. This shaft can be seen as the central part of the nervous system of the building, through which all movement happens.

The building was however not meant to last. The building had a design period of 4 months and were realised in a mere 30 days (Koolhaas et al, 2011 p. 388). This fast development of two entire towers in such a short period of time showed the power of modularity and pre fabrication, but also meant that the building was rushed and that the design was still changing during the construction. The capsules were meant to have a lifespan of 25 years after which they should have been replaced with new capsules (Ming, 2021), this however proved too costly and even though Kisho Kurokawa meant for the capsules to become replaceable, not a single capsule ever got replaced, and all 144 original capsules are still hanging there as of today (Iconichouses, 2020). 30 capsules are also abandoned due to leaks and mildew, the structure is full of asbestos and a net is hanging over the building to protect passing pedestrians against falling debris. Because of this the building is becoming threatened with demolition and certain groups like the Kisho Kurokawa Architect & Associates group are looking into restoring the building by replacing the capsules.

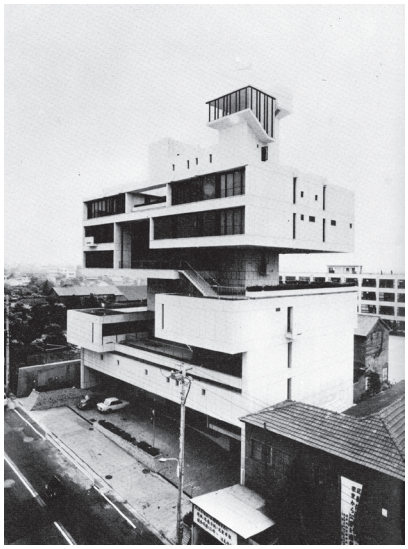
3.2 The embassy of Kuwait, by Kenzo Tange

Another Metabolist building that got realised is The embassy of Kuwait in Tokyo, by Kenzo Tange which was realised in 1970. The building serves two functions, there is a chancellery at the bottom of the building and a private residence for the chancellor at the top. The building is again build along two central shafts, just like the capsule towers, the difference is however that this time the structure surrounding the central shafts was made to be more permanent instead of the intended replaceability of the capsules in the capsule tower. The central shaft also once again houses most of the traveling space of the building, along with the technical room.

Figure 12. (left) The embassy of Kuwait, by Kenzo Tange
Figure 13. (right) The division of the two functions
From: https://nl.pinterest.com/pin/549228117034094203/

The central shaft also allow for the private residence to be further elevated into the air, creating an empty space between the two functions (Arquitectura, 2018). This empty space helps not only with distinguishing between the upper and lower function of the building, but also allows for an elevated courtyard with a garden to be created between the functions. A determining factor for creating this elevated courtyard was the small size of the given plot, which forced Kenzo Tange to develop the building vertically instead of horizontally (Manifest05, 2015).

The lower public section of the building is kept quite introverted with little windows while the upper private floor is made extroverted with considerably more windows and the focus of them laying on the back and front of the building. Even though these two sections are so different from each other, in both function and design, they still share a common entrance (Hobson, 2020).



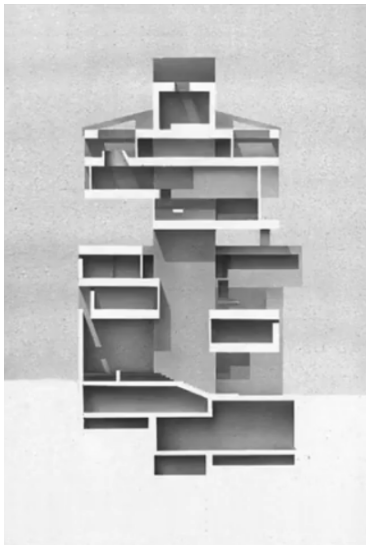


Figure 14. (left)
The central shafts as seen from the outside
From: https://www.flickr.com/photos/bryan/2631149977

Figure 15. (right)
The central shafts as seen through a section
From: https://www.flickr.com/photos/27045616@N02/2633756876/

3.3 Odakyu Drive-in Restaurant, by Kisho Kurokawa

The Odakyu Drive-in Restaurant is a small US-style roadside diner in the resort of Hakone, realised in 1969. It is another prime example of Metabolism. Like other Metabolist buildings the drive-in restaurant makes use of large platforms with capsules on them and puts an emphasis on organic growth. Unlike other buildings however the Odakyu Drive in Restaurant does not make use of a central shaft, Instead the entire buildings is supported by a large steel structure which also suspends the rest of the building. This steel support structures was constructed in such a way that it allowed for the building to be stackable and be further expanded on. The joints between the steel beams were also designed to allow for new steel beams to easily attach to the building (Koolhaas, 2011, p.347).

Figure 16.
The Odakyu Drive-in Restaurant by Kisho Kurokawa, 1969

From: https://nl.pinterest.com/pin/270638258836266745/

The idea of suspending platforms in the air as seen in the Odakyu Drive-in Restaurant also greatly falls in line with Metabolism. As we already discussed in the first chapter, Metabolism came partially into existence because Japan's needed of more surface area for its dense population. At first this manifested into city plans like Tange's 'A plan for Tokyo city, 1960', which creates more land on the water, but later also got translated to creating more open land in the air as you can see in this building.

The restaurant was originally intended as a prototype for a larger building that was designed with the same principles. In this model made by Kurokawa, which he displayed at Expo '70, we get a glimpse of this unrealised building and how it would expand. This way of expansion is completely different from the ways the other metabolist buildings have expanded thus far. The Capsule towers used the idea of a central shaft and allowed for different and new capsules to be attached to this. The Odakyu Drive-in Restaurant however expands the entire building through its stackable support structure. The load-bearing structure was also not only designed in such a way to allow for organic growth, but it also allowed the building to grow over rough terrain and hills with relative ease.

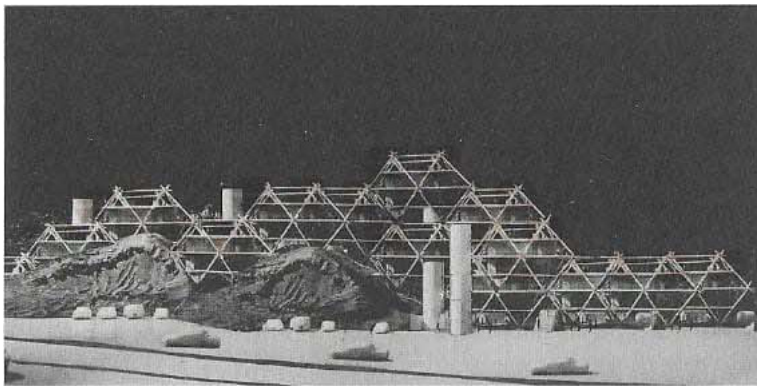


Figure 17.
A model of the expanded version of the building
a scan from the book Project Japan by Rem Koolhaas, 2011

3.4 The Rotterdam, by OMA

The Rotterdam, by OMA was completed in 2013 and is the largest building of the Netherlands. The Rotterdam is located in the Maaszone in Rotterdam en consists out of three towers of 150 meters and with 38 floors each. These towers are situated on top of a 6 story high plinth.

The Rotterdam can almost be seen as a vertical city that mixes varying functions into one building: Housing, offices, conference rooms, a hotel, stores, restaurants, leisure activities and a parking garage are all present in this building, which all together create activity for 24 hours a day around the building. (De Rotterdam, 2018) The building is then also divided into blocks all with their own separate functions, the lower floors are reserved for parking and public spaces, the higher outer blocks are for residential and hotel functions and the central part is used for office spaces (OMA, 2013).

Figure 18.
The Rotterdam
by OMA

From: https://www.dearchitect.nl/architectuur/nieuws/2013/11/de-rotterdam-opgeleverd-101122001

Halfway through the building the towers suddenly shifts compared to each other. This sudden shift separates the towers into two parts, a low rise and a high rise section, and creates space for terraces and crossways between the towers. And despite its scale and apparent solidity, the building's shifted blocks create a constantly changing appearance, different from every part of the city (Aguilar, 2020).

Rem Koolhaas his influence on the building is clearly visible whilst studying it. He believes that chance interactions between people should be stimulated because they lead to more innovation and creativity (Lynch, 2019). This idea is visible throughout the entire building: The building has many functions that normally don't appear in the same structure. This mixing of programs can be seen as cross-programming, a way of designing architecture that tries to stimulate these chance interactions, which we already discussed in the previous chapter.

Figure 19.
The layout of the Rotterdam

From: https://oma.eu/projects/de-rotterdam

3.5 The Silodam, by MVRDV

The Silodam was specifically designed to house a diverse group of people, both culturally and economically. This was partially due to meet the demand for the building, but also helped with creating a counterbalance with the increasing individuality of people (MVRDV, 2005 p. 964). To allow for a diverse group of people to live there they also tried to keep the houses as diverse as possible, some surround a corridor, a garden, a gallery, or a hall. All the views also differentiate from each other. There are houses with a panoramic view, with views to two sides, double-high houses, houses with a patio, and houses with a view to the harbour.

Figure 20.
The Silodam
by MVRDV

From: https://www.archdaily.com/537940/a-new-architectural-style-for-the-age-of-the-individual

The different stakeholders of the building were also able to form discussions with each other during the design process of the building. These discussions were all regarding the final layout of the building and are the reason behind why both the interior and exterior are as diverse as they are now. The indoor hallways now suddenly shift to an outside gallery for example and the outside of the building looks like a diverse bunch of façades placed next to each other because of this.

This diversity in the facade also allows the building to look like a stack of shipping containers, with a variety of different colours and material finishes creating stripes across the facade (MVRDV, 2005 p. 962). This containery look also flows well into the harbour that surrounds the building. Next to the Silodam there are old silos from centuries past which the building plays into, creating their own kind of current day silo. The building is also elevated above the water, which in turn makes it look like it is almost floating. Due to this diverse look you get that feeling that this building would consist of many capsules and that maybe in the future it could be further expanded upon by simply adding more capsule on top of next to it. After studying the floor plan however you can see that this is not the case. All these compartments only look like different capsules but structurally are not. The building consists of a single solid mass and not of separate capsules which can be expanded upon or which can be replaced.

Inside of the building the corridors are designed to function like internal streets. These streets almost flow through the building with various meeting places now and then. The corridors also aren't kept in a straight line but make multiple sharp turns to allow for the inside corridor to change into an outside gallery. Other apartments are completely different again and have a shared balcony outside instead of a gallery which allows them to socialize with their neighbours. These streets, meeting places and shared balconies make it so that there is always something happening and always something moving inside of the building.

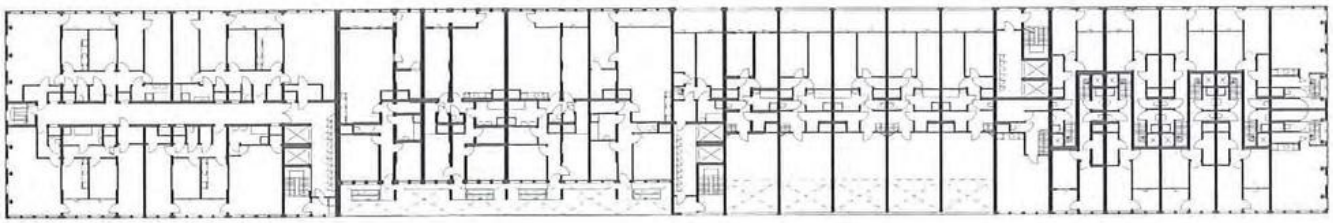


Figure 21. Floor plan of the 6th floor of the Silodam
From: https://docplayer.net/53292770-Innovation-in-housing-mixing-typologies.html

3.6 Dutch Pavilion at the 2000 expo, by MVRDV

The Dutch Pavilion was a pavilion made by MVRDV during the 2000 expo in Hannover. The building consists of multiple open layers that all represent various Dutch landscapes and their ecosystems. The building was an experiment that tried to create more vertical space whilst also trying to save energy, time, water and infrastructure. It could then also be seen as a mini-ecosystem or future survival kit that explored how to ensure adequate light and addressed a lack of land (MVRDV, 2003).

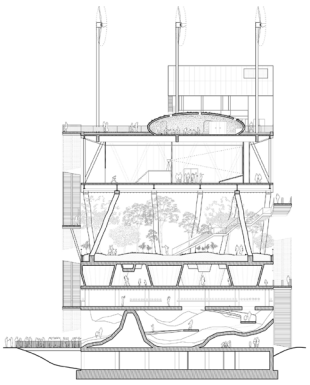


Figure 22. (left) The Dutch pavilion at the 2000 expo, by MVRDV, 2000
Figure 23. (right) A section of the pavilion
From: https://www.mvrdv.nl/projects/158/expo-2000

The theme of this design was "Holland creates space" and wanted to show everyone how a smaller country could make the most out of its land with the limited amount of space they have. This completely coincides with the Metabolist design principles, whom also worked from the standpoint of creating more surface area for their country. The way in which the pavilion creates this new space also largely coincides with Metabolist architecture. The floors are kept open and actually try to become a part of nature instead of completely separating from it.

The design principles for the pavilion were all very optimistic, they looked at how to create harmony between nature and technology without the two hampering each other. The pavilion also looked into densification which is ever prevalent in the Netherlands and how the quality of life can stay high during this process by creating vertical nature (MVRDV, 2003).

The pavilion also explored the limits of this kind of new and artificial nature. They put an emphasis on natures make-ability and artificiality not only by stacking these ecosystems on top of each other but also by using unnatural elements within them, like the steel trees that hide the support structure, or the green UV lights that provide the greenery in the building with sufficient light. And through this show that nature and technology can cooperate hand in hand instead of the usual mindset that thinks that the two are opposites of each other.

Figure 24.
The self-made nature within the pavilion

From: https://www.mvrdv.nl/projects/158/expo-2000

3.7 Similarities and differences

When we start analysing the buildings individually you start to notice the diversity in Superdutch buildings and the difference in their design principles. Take the Dutch Pavilion at the 2000 expo, by MVRDV for example: this building was made with design principles that are almost completely identical to those of Metabolism. Both the building and this movement try to solve the problem of a lack of space in their country by expanding their public spaces and nature vertically. When you start comparing this pavilion to individual Metabolist buildings you then also start to see a lot of similarities. Buildings like Kenzo Tange's embassy of Kuwait also tries to keep nature in the picture by adding it in between the layers of the building, and Odakyu Drive-in Restaurant by Kisho Kurokawa also has suspended platforms hanging in the air that function as public spaces.

Other Superdutch buildings might however not always be influenced by Metabolism. Take the Silodam, another building by MVRDV for example. At a quick glance one might say that the apartments in that building noticeably resemble capsules for the way that they look. But when you start further looking into them you start noticing big differences. Metabolist capsules were made in order to allow for organic growth and decline and to experiment with prefabrication. The Silodam had completely different reasons. Part of their design process was to try and stimulate both economical and cultural diversity in the building and for this they allowed the different stakeholders to have a say in the design process and change the look of the apartments. This reason, together with them wanting the building to resemble a stack of freight containers led to this specific look for the Silodam. Also when you start looking at the floor plans of the Silodam you can see that the compartments that look like capsules are all just one solid and are not meant to be replaced or expanded upon.

De Rotterdam is another example of a Superdutch building that does not take influence from Metabolism. Rem Koolhaas designed this building, and has shown great interest in the Metabolist movement in the past, so one could expect that he would be one of the Superdutch architects that used Metabolism as an inspiration in their own work. When looking at examples of his work, like the Rotterdam this becomes harder to see however. You could maybe argue that he took the idea of a central nervous system as inspiration during the design of the building when you take a closer look at it. The large plinth underneath the building is used as a large public space that connects all the towers together, Therefore you could see this part of the building almost as a horizontal shaft which is often at the centre of metabolist buildings. But it is more likely that this plinth was designed with cross-programming functions in mind, which Rem Koolhaas is also known for.

When we start comparing the movements as a whole we can see that the two movements almost originated under the same circumstances: both movements were a group of younger architects that reacted on the stagnation of innovation and tried to cause change. The movements also had to tackle some of the same problems. Metabolism and parts of the Superdutch movement tried to tackle problems like the lack of space. Even though they usually tried to solve these problems differently, like Metabolism expanding on the sea and Superdutch trying to solve this internationally, Superdutch still most likely looked at Metabolism and tried to learn from their ways of solving these problems. Take the Dutch pavilion at the 2000 expo, by MVRDV and the embassy of Kuwait, by Kenzo Tange for example. These two buildings both try to solve the problem of a lack of space by creating gardens and public space on elevated platforms, and it is therefore most likely that MVRDV studied the designs of Metabolism before creating this building themselves.

Due to the vast variety in Superdutch works. Even though Superdutch is technically a singular movement, all the architects that took part in it vastly differed from each other and all had their own styles. A couple of Superdutch architects are most definitely inspired and influenced by Metabolism, like Rem Koolhaas, who has shown great interest towards the movement, and MVRDV that tries to tackle some of the same problems that Metabolism addressed, but that does not immediately mean that the entire movement was influenced by it. And even though not all aspects like a central shaft and capsules were used as inspiration for Superdutch other aspects like horizontal creation of space were.

Conclusion

Metabolism and Superdutch both originated under the same circumstances: both movements consisted out a group of younger architects that reacted on the stagnation of innovation and tried to cause change in their country. The metabolists tried to tackle the problems of a large part of the population moving to the cities, automobiles becoming more available to the public, a lack of social services and a shortage of land. At first they tried to solve these problems by designing cities that floated on water, and which were able to rapidly change to the demand of the city by creating modular housing that revolved around a road network that functioned as a sort of central spine. Later they took these ideas and also implemented them on an architectural scale. Buildings were made modular through capsules in order for it to grow and shrink on demand, have a central shaft as a central nervous system and create land not on the water but vertically on higher floors of the building.

Superdutch on the other hand was a lot more diverse and does not have many key characteristics by which they can be defined. The movement originated when a group of younger architects wanted to break free from the styles that were currently present in the Netherlands. Up until this point, architectural styles were heavily mandated by the TU Delft and larger firms, which would impose their older styles onto the younger generations. Superdutch was in a sense not specifically a movement that had a manifesto, but more so a group of architects that all became large internationally around the same time because they wanted change.

When we start looking at individual Superdutch architects and firms like Rem Koolhaas and MVRDV, we start to notice the potential influence that Metabolism might have had on them. Rem Koolhaas was always very interested in the movement, even going as far as writing an entire book on them. MVRDV also tried to tackle some of the same problems as Metabolism. Both think that there is a lack of available space and that this needs urgent addressing. Metabolism tried to solve this by creating cities on the water whilst MVRDV argues for an optimized layout of our land called a 'Hyperoptimized world.'

When we start analysing and comparing works of both movements we can see that it is heavily dependant on the architect and on the design how much influence Metabolism had on them. Take MVRDV's Dutch pavilion at the 2000 expo for example. This building tries to solve the problem of a lack of space by creating more public green space vertically, just like many older Metabolist buildings did. You can therefore also see many similarities between the two and it is most likely that MVRDV got influenced by Metabolism in this building. But on the other hand we also have buildings like the Rotterdam, by OMA. The Rotterdam was designed by Rem Koolhaas, so you would think that Metabolism would have some influence on this design because of his interest in this movement. When we have a closer look at it, however, you can see that it was actually more so inspired by other beliefs, like Koolhaas' idea of cross-programming rather than by Metabolism.

So in short, due to the diversity of Superdutch and its architects it is impossible to make a statement about the influence of one movement on the other as a whole. What you could say however is that both movements arose under almost the same circumstances and that, even though the movements as a whole might not be influenced by each other, certain architects within the Superdutch movement, like MVRDV, were most certainly influenced by Metabolism.

Literature:

Aguilar, C. (2020, 14 december). De Rotterdam / OMA. Geraadpleegd op 16 maart 2021, van https://www.archdaily.com/451377/de-rotterdam-oma

Arquitectura. (2018, 10 april). _ Embassy of Kuwait in Tokyo - Data, Photos & Plans. WikiArquitectura. https://en.wikiarquitectura.com/building/embassy-of-kuwait-in-tokyo/

Britannica. (2009). Rem Koolhaas | Dutch architect. Encyclopedia Britannica. Geraadpleegd op 6 april 2021, van https://www.britannica.com/biography/Rem-Koolhaas

De Rotterdam. (2018, 6 februari). De Rotterdam. Geraadpleegd op 9 februari 2021, van https://derotterdam.nl/

Giele, M. (2020, 22 oktober). SELECT Jaren 90: Opkomst van Superdutch in de Nederlandse architectuur. De Architect. https://www.dearchitect.nl/architectuur/artikel/2020/10/select-jaren-90-opkomst-van-superdutch-in-de-nederlandse-architectuur-101254523

Hobson, B. (2020, 17 april). Kenzo Tange's Kuwait Embassy "looks like a person carrying two water buckets" says YouTuber Martin van der Linden. Dezeen. https://www.dezeen.com/2020/04/17/kenzo-tange-kuwait-embassy-one-minute-architecture-video/

Iconic houses. (2020, 21 maart). Nakagin Capsule Tower. https://www.iconichouses.org/icons-at-risk/nakagin-capsule-tower

Joostdevree. (z.d.). superdutch. Geraadpleegd op 8 april 2021, van https://www.joostdevree.nl/shtmls/superdutch.shtml

Kloosterman, R. C. (2007). Walls and bridges: knowledge spillover between "superdutch" architectural firms. Journal of Economic Geography, 8(4), 545–563. https://doi.org/10.1093/jeg/lbn010

Koike, Y. (2018). An appeal for help in restoring a Tokyo architectural masterpiece. Change.org. https://www.change.org/p/%E6%9D%B1%E4%BA%AC%E9%83%BD%E7%9F%A5%E4%BA%8B-%E5%B0%8F%E6%B1%A0%E7%99%BE%E5%90%88%E5%AD%90-%E6%9D%B1%E4%BA%AC%E3%81%8C%E4%B8%96%E7%95%8C%E3%81%AB%E8%AA%87%E3%82%8B%E5%90%8D%E5%BB%BA%E7%AF%89-%E4%B8%AD%E9%8A%80%E3%82%AB%E3%83%97%E3%82%BB%E3%83%AB%E3%82%BF%E3%83%AF%E3%83%BC%E3%83%93%E3%83%AB-%E3%82%92%E4%BF%9D%E5%AD%98%E3%81%97%E3%81%A6%E3%81%8F%E3%81%A0%E3%81%95%E3%81%84

Koolhaas, R., Obrist, H. U., _., Westcott, J., _____, & Office for Metropolitan Architecture. AMO. (2011). Project Japan. Taschen.

Lin, Z. (2007). Urban structure for the expanding metropolis: Kenzo Tange's 1960 plan for Tokyo. Journal of Architectural and Planning Research, 24(2), 109–124. Geraadpleegd van https://www.jstor.org/stable/43030795

Lin, Z. (2010). Kenzo Tange and the Metabolist Movement: Urban Utopias of Modern Japan (1ste editie). London, England: Routledge.

Lootsma, B. (2000a). Superdutch (1ste editie). Amsterdam, Nederland: Sun Uitgeverij.

Lynch, P. (2019, 17 november). Spotlight: Rem Koolhaas. ArchDaily. https://www.archdaily.com/449282/happy-birthday-rem-koolhaas-2

Manifest05. (2015, 23 april). The Kuwait Embassy and Chancellery in Tokyo, Japan. Tumblr. https://manifest05.tumblr.com/post/117177006129/the-kuwait-embassy-and-chancellery-in-tokyo-japan/amp

Ming, Y. (2021, 10 februari). Pictures Reveal Life Inside Tiny Futuristic Cubes. National Geographic. https://www.nationalgeographic.com/photography/article/nakagin-capsule-tower

MVRDV, Maas, W., & Berlage Instituut. (2005). KM3, Excursions on Capacities. Barcelona, Spain: Actar.

MVRDV. (2003). Expo 2000. https://www.mvrdv.nl/projects/158/expo-2000

OMA. (2013). De Rotterdam. Geraadpleegd op 17 maart 2021, van https://oma.eu/projects/de-rotterdam

Ouroussoff, N. (2012, 1 september). Why is Rem Koolhaas the World's Most Controversial Architect? Smithsonian Magazine. https://www.smithsonianmag.com/arts-culture/why-is-rem-koolhaas-the-worlds-most-controversial-architect-18254921/

Rosenfield, K. (2017, 14 september). CCTV Headquarters Named "Best Tall Building Worldwide". ArchDaily. https://www.archdaily.com/447168/cctv-headquarters-named-best-tall-building-worldwide

Schalk, M. (2014). The Architecture of Metabolism. Inventing a Culture of Resilience. Arts, 3(2), 279–297. https://doi.org/10.3390/arts3020279

Sveiven, M. (2018, 10 april). AD Classics: Nakagin Capsule Tower / Kisho Kurokawa. ArchDaily. https://www.archdaily.com/110745/ad-classics-nakagin-capsule-tower-kisho-kurokawa